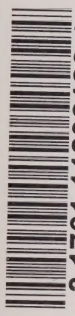


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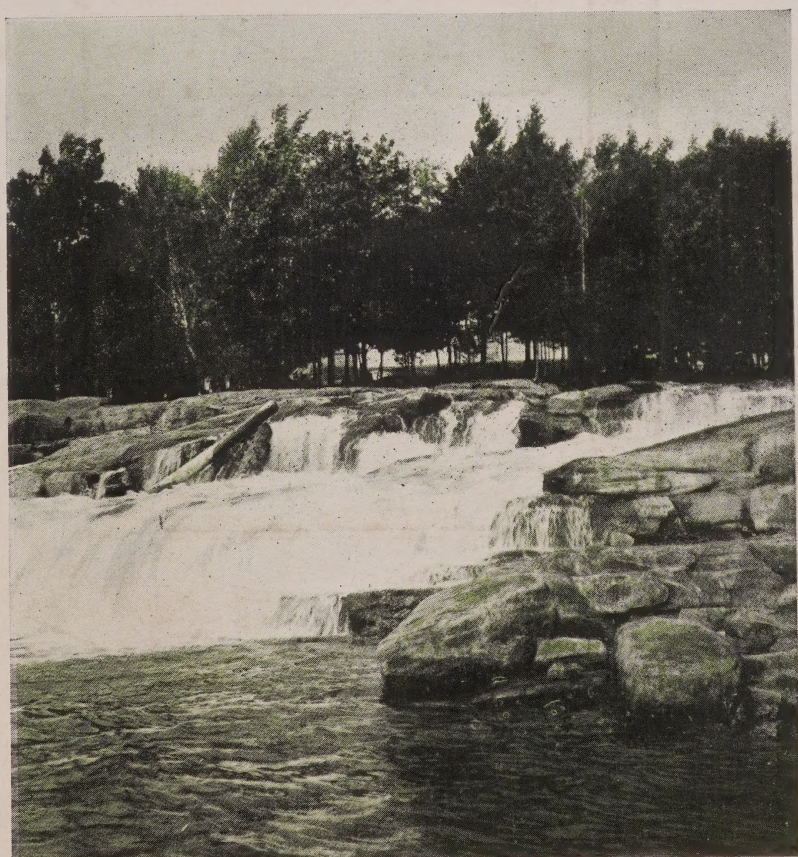
THE BULLETIN

Vol. VI.

No. 1

Hydro-Electric Power Commission of Ontario

JULY 1919



Muskoka River

THE **BULLETIN**

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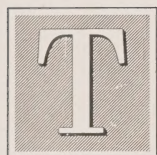
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Editorial

Our Convention Issue



THIS issue of THE BULLETIN is devoted almost entirely to a chronicle of the A. M. E. E. Convention.

This was by long odds the most successful convention the Association has yet held, and as the official organ of the A. M. E. E., it becomes our manifest duty to shelve other matters temporarily, and give our readers the best possible account of the subjects discussed and the conclusions arrived at.

Of course, no account of a convention can faithfully reproduce the convention spirit which prevails at gatherings of this sort. It is this informal spirit, this meeting together and discussing matters in public, which is so particularly helpful to

everyone alike. There is an old saying that "Two heads are better than one." This is acknowledged to be true by all, and at the convention we have, once a year, the advantage of a multitude of minds focussed on problems which are of the greatest possible interest to all.

A feature which contributed a great deal to the success of the convention was the attendance of a goodly number of commercial members and the exhibits of material and appliances. The manufacturers made a splendid showing of their different goods, and are to be complimented upon their foresight in taking advantage of this splendid opportunity of showing their appliances to a select and appreciative audience.



Minutes of the Convention

June 19—Afternoon Session.

The meeting was called to order at 3 o'clock, the President, Mr. O. H. Scott, Belleville, being in the chair.

Moved by Mr. A. T. Hicks, Oshawa, and seconded by Mr. H. O. Fisk, Peterboro.

"That the minutes of the last Convention of the Association be taken as read." Carried.

The minutes of the last meeting of the Executive Committee were read and adopted.

The Vice-President taking the chair, the President presented his opening address, which was heartily received.

The President having re-taken the chair, the Secretary read his report.

Moved by Mr. P. B. Yates, St. Catharines, and seconded by Mr. E. I. Sifton, Hamilton:

"That the Secretary's report be adopted, and that those applying for Commercial and Associate Membership in this Association be elected." Carried.

The Treasurer, Mr. R. C. McCollum, read his report.

Moved by Mr. E. H. Caughell, St. Thomas, and seconded by Mr. J. E. B. Phelps, Sarnia:

"That the Treasurer's report be adopted." Carried.

Proposed revisions of the Constitution and By-laws were taken up.

Moved by Mr. M. J. McHenry, Walkerville, and seconded by Mr. A. T. Hicks, Oshawa:

"That the amendments to the Constitution and By-laws as passed by

the Executive Committee be adopted."

Mr. Yates spoke, calling attention to the proposed change in the name of the Association by substituting the word "Utilities" for the word "Engineers," and outlined the reasons for making the change.

Mr. Sifton did not think it advisable to adopt the suggested change in regard to elections, believing this should be given more time for consideration.

Amendment, moved by Mr. E. I. Sifton, Hamilton, and seconded by Mr. P. B. Yates, St. Catharines:

"That the suggested amendments to the Constitution and By-laws be adopted excepting clauses 8 (a), (b), (c), (d), and (e), which shall be left over for decision until the next regular meeting." Carried.

According to this amendment various clauses were changed to read as follows.

Association of Municipal Electrical Utilities of Ontario.

Constitution.

This organization shall be known as the Association of Municipal Electrical Utilities (of Ontario).

By-Laws.

1. Membership.

(c) A class "A" delegate . . . the Hydro-Electric Power Commission of Ontario. Utilities shall be entitled to class "A" representation in accordance with the following schedule, based upon the number of electrical consumers at the end of the previous calendar year:

Less than 1,000 consumers—1 Class "A" delegate.

1,001 to 2,000 consumers—2 Class "A" delegates.

2,001 to 3,000 consumers—3 Class "A" delegates.

3,001 to 5,000 consumers—4 Class "A" delegates.

5,001 to 10,000 consumers—5 Class "A" delegates.

Over 10,000 consumers—6 Class "A" delegates.

2. Associate Membership.

Persons not eligible to either of the former two classes but are interested in the objects and aims of the Association may be elected as Associates by a two-thirds vote of the Executive Committee present at any Executive Meeting of the Association, which election shall be subject to the approval of the Association at a general meeting; or may be elected by the Association by a two-thirds vote of the class "A" delegates present at any general meeting of the Association.

3. Commercial Membership.

Manufacturers . . . Commercial Members by a two-thirds vote of the Executive Committee present at any Executive Meeting of the Association, which election shall be subject to the approval of the Asso-

ciation at a general meeting; or may be elected by the Association by a two-thirds vote of the class "A" delegates present at any general meeting of the Association.

4. Privileges.

(a) Class "A" delegates . . . and shall hold the only voting rights, either in person or by proxy, at general meetings. The presiding .

(d) Commercial members . . . to hold office, except as members of standing committees.

6. Meetings.

(b) A quorum for the purpose of transacting business at a general meeting of the Association shall .

(c) Motions shall . . . present at a general meeting. All motions shall be presented in writing, signed by the mover and seconder.

(3) Parliamentary procedure shall be followed at all general and executive meetings of the Association.

7. Standing Committees.

(a) 4. Regulations and Standards Committee.

(b) Each Committee . . . by the Association at a general meeting.

(c) The chairmen . . . Executive officers, and the past President of the Association . . .

(e) The Association . . . Committee Meetings. It will also reimburse the members of Standing Committees and Committees appointed for specific purposes, for the amount of their railway expenses due to attending meetings of those Committees.

9. Fees.

(c) The Treasurer . . . in writing, certified by two auditors to be elected by the Association at the



Some Members Come Right over in their little Henry's

first general meeting in each year, at least once annually.

10. Transactions.

The transactions of the Association shall be edited by the Secretary and published.

Mr. R. C. McCollum, Auditor, of Municipal Accounts, Hydro-Electric Power Commission of Ontario, read a paper entitled "Routine Handling of Municipal Accounts."

Discussion following this paper was taken up by Messrs. A. R. Porter, A. L. Whitelaw, H. P. L. Hillman, M. J. McHenry, J. W. McLean, W. H. Childs, A. E. Clark, P. B. Yates and W. G. Ferguson.

Moved by Mr. H. P. L. Hillman, Toronto, and seconded by Mr. V. B. Coleman, Port Hope:

"That a vote of thanks be extended to Mr. McCollum for his excellent paper." Carried.

The President drew attention to copies of a booklet entitled "The Origin of the Ontario Hydro-Electric Power Movement," that had been sent by the Kitchener Commission for circulation. He also announced a baseball match between the clerical staff of the Chippawa Development and the Association, to take place on the following evening.

The meeting adjourned at 6 o'clock p.m.

At 7 o'clock the Association met for dinner at the Clifton, where it was addressed by Mr. K. A. McIntyre, President of the Contractor Dealers Association, and Mr. A. Monro Grier, K.C., President of the Canadian Electrical Association, the latter being introduced by Mr. H. H. Couzens, of Toronto.

June 20--Morning Session, 10 o'clock.

The Secretary made a supplementary report of applicants for Commercial Membership.

Moved by Mr. H. F. Shearer, Smith's Falls, and seconded by Mr. H. O. Fisk, Peterboro:

"That Munderloh & Co., the McClary Manufacturing Co., and the Hoover Suction Sweeper Co. be elected Commercial Members of this Association." Carried.

Mr. S. A. Chace, of the Westinghouse Electric and Mfg. Co., and Mr. W. L. Goodwin, of the General Electric Co., addressed the Association concerning the Goodwin Plan. Discussion following these addresses was taken up by Messrs. O. M. Perry, A. T. Hicks, J. E. B. Phelps, K. A. McIntyre, C. Meyrick and H. F. Shearer.

Moved by Mr. R. H. Martindale, Sudbury, and seconded by Mr. J. E. B. Phelps:

"That this Association extend to Mr. Chace and to Mr. Goodwin a very hearty vote of thanks." Carried.

Moved by Mr. Martindale and seconded by Mr. Phelps:

"That this Association urge that all reasonable steps be taken to introduce into this country a standard plug and receptacle for all appliances, and that the Regulations and Standards Committee take active steps in this important matter." Carried.

The meeting adjourned at 1.15 o'clock p.m.

Afternoon Session, 3 o'clock.

Mr. Wills MacLachlan addressed the Association in reference to a book containing the Rules for Resuscitation from Electric Shock by the Prone Pressure Method and Proceedings

and Resolutions of Third Resuscitation Commission.

Moved by Mr. H. H. Couzens, Toronto, and seconded by Mr. T. E. Bell, Mimico:

"That the Rules for Resuscitation from Electric Shock by the Prone Pressure Method and the Proceedings and Resolutions of the Third Resuscitation Commission be adopted by the Association." Carried.

The President spoke of the proposed joint committee of various manufacturers and dealers' associations, pointing out the desirability of this Association being represented on that committee.

Moved by Mr. J. E. B. Phelps, Sarnia, and seconded by Mr. H. O. Fisk, Peterboro:

"That this Association heartily approve of co-operation with other electrical organizations in the formation of a provincial central body, and that the President of this Association be a representative to act in conjunction with the other electrical associations." Carried.

Mr. M. J. McHenry, Walkerville, presented the report of the Committee, consisting of himself, Mr. E. V. Buchanan, London, and Mr. O. M. Perry, Windsor, in reference to Meter Inspection Tariffs.

Moved by Mr. M. J. McHenry, Walkerville, and seconded by Mr. E. V. Buchanan, London:

"That,

"Whereas the Inspection Act, under clause 27, in regard to the regulation of fees for testing of electrical meters, states that such fees shall be so apportioned that they will as nearly as possible meet the actual

cost of effectually carrying on such inspection.

"And,

"Whereas the report of the Inland Revenue Department shows that in the past nine years there is a net surplus from inspection of electric meters amounting to \$328,773.29.

"And,

"Whereas the rates now in force were designed some years ago, when conditions were vastly different from those existing at present, and as there will be an ever increasing use of electric meters, with consequent re-inspection of same.

"Therefore,

"Be it resolved that, in the opinion of the Association of Municipal Electric Utilities of Ontario, the present inspection fees are much too high, and this Association therefore petitions the Department of Trade and Commerce to give the question of reduction in the rates for electrical meter inspection serious consideration, and to effect such reduction in keeping with the intent of the Inspection Act." Carried.

Mr. C. E. Schwenger, Engineer of Distribution, Toronto Hydro-Electric System, read a paper entitled "Overhead Distribution Systems."

Discussion following this paper was taken up by Messrs. E. I. Sifton, J. G. Jackson, F. C. Adsett, and H. C. Barber.

A hearty vote of thanks was extended to Mr. Schwenger for his excellent paper.

Mr. W. M. Andrew, secretary of the Manufacturers and Jobbers Associations, addressed the meeting, outlining the objects of the work he was just entering into.

Mr. R. H. Martindale, Sudbury, presented the report of the Committee on Bare vs. Weatherproof Covered Wire.

This report brought out considerable discussion from Messrs. J. G. Jackson, E. V. Buchanan, F. C. Adsett, Wills MacLachlan, Gordon Kribs and T. E. Bell.

Moved by Mr. J. G. Jackson, Chatham, and seconded by Mr. H. O. Fisk, Peterboro:

"That the thanks of the meeting be offered to the Committee for their excellent report." Carried.

The meeting adjourned at 6 o'clock, after which the members met in the park for a game of baseball between a picked team from the Association and the clerical staff of the Chippawa Development.

June 21—Morning, 9.30 o'clock.

The Association became the guests of the Hydro-Electric Power Commission of Ontario on this morning, which conducted the members over the works of the Chippawa Development. This took up the whole morning and completed the programme of the Convention.

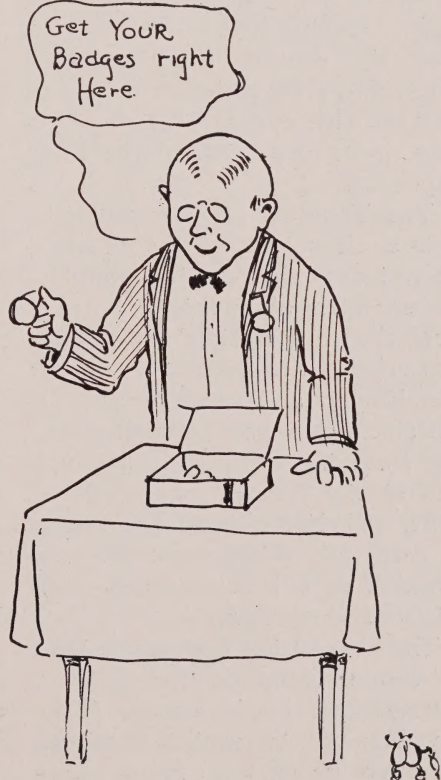
A feature of the Convention, outside of the meetings, was an exhibit by the various commercial members. This proved highly interesting and beneficial to all parties. There were twenty companies represented in the exhibit.

The register shows the Association to be increasing as to attendance.

The representation was as follows:

Class A.....	53
Class B.....	42
Commercial.....	83
Associates.....	37
Guests.....	24

Total.... 239



President's Address

Gentlemen,—

On behalf of the Association, it affords me great pleasure to extend to you a hearty welcome at this our third meeting. There are many here who have been absent several years, having given up their positions to serve their country. To them I extend a most hearty welcome. We are delighted to have you back.

The Secretary's report will advise you that our membership has grown considerably over that of last year. We welcome you, the new representatives, and trust that the Association will be as much benefit to you in the future as it has to us in the past. And just here let me point out that the returns, from the time given and expense incurred in connection with our Association Meetings, is in proportion to the effort expended.

The Treasurer's report will give you a clear idea of the financial operations of the Association and its present financial condition. You will note that our receipts are not increasing at the same rate as our membership and expenses are. If the amendment goes through to pay the travelling expenses of standing and special committees, something will have to be done to find the means to carry on, as the work which is ahead of us will require many committees and meetings.

The Convention Committee is to be congratulated on the splendid arrangements they have made. They have been very energetic in obtaining the entertainment and comfort neces-

sary for our enjoyment. May I suggest that at our next summer meeting it would be a step in the right direction to invite the ladies? They have been allowed in on nearly every other organization, so why should we leave them out?

A new departure in connection with our meetings is the display by the commercial members. They are to be congratulated on their splendid exhibits, and all the members should see them. It is a great opportunity to become acquainted with material and appliances which otherwise one could not become familiar with. I trust it will be a beneficial innovation and that it will become a permanent feature of our Conventions.

The Papers Committee have prepared a programme which I am sure will meet with your approval, and be most profitable. They have endeavoured to provide papers which will interest the entire membership. You will note that the papers are short, as the idea of the Committee was "Short on the Paper and Long on the Discussion." It is through the discussion and the bringing out of the individual experiences that we are to reap the greatest benefit from these meetings, so I hope that all will take part in providing a lively and snappy discussion.

You will have noted from the Minutes of our executive meetings that the question of the charges for inspection of meters has been before us. This question is very important, and it is to be hoped that the report of the Committee appointed to deal

with it will enable us to take some definite action.

Since the last meeting of our Association, action has been taken which will bring about a closer co-operation between the various branches of the electrical fraternity. In other words, the Goodwin Plan is working and the bridge is being brought into balance. It has been my privilege to keep in close touch with this question, and I feel sure that the day is not far distant when we shall have a provincial, (if not a national) electrical organization which will embrace all the various electrical branches. This will not only be a benefit to the electrical men, but to the public as well.

Some effort should be made in the near future to provide a means for the better education of the employees of our utilities. I am pleased to note that the Government are making provisions for industrial training, but it appears that even with this assist-

ance there is a large amount of work to be done by an Association such as ours. An Employees Relations Committee could handle this matter, which, besides education, would report on such matters as "Sick Benefits," "Pensions," "Accident Prevention," etc.

You have received copies of proposed amendments to the Constitution. These are necessary owing to our growth. They have been brought in on the recommendation of a Committee under the Chairmanship of Mr. Couzens, and have been passed upon by the Executive.

Now, gentlemen, the field is so large that I could continue on indefinitely pointing ways and means to keep the members of our organization busy, but I will not occupy the time further. I hope you enjoy yourselves, and leave for home feeling that this Convention has surpassed, if that were possible, all previous Conventions.

Report of Committee on "Bare vs. Weatherproof Covered Wires for Potentials above 750 Volts"



YOU will remember that at the January meeting of this Association the excellent paper by Mr. A. S. L. Barnes, on the above subject, provided a very interesting and profitable discussion. Owing to the somewhat limited amount of time then available and with a view to bringing out additional information, it was felt that the practical side of the question should receive still more attention and discussion. A committee was therefore appointed by

ex-president Buchanan for the purpose of obtaining the opinions of experienced outside construction and maintenance men as to the relative merits of the "Bare vs. Weatherproof Covered Wire" for potentials above 750 volts. The committee appointed consisted of: John J. Heeg, Guelph; T. E. Bell, Mimico; C. W. Alford, London; J. W. Cook, New Toronto; and the writer.

As it was desirable to reach as many as possible of those qualified to express an opinion, it was decided that a circular letter, with a question

form, was the best method of obtaining the desired results. The questions submitted were as follows:

(1) Considered from the standpoint of safety to life, is weatherproof line wire safer than bare wire for general distribution on voltages over 750?

(2) If so, at what voltage is a covering of no value?

(3) Is weatherproof wire any advantage from an operating standpoint, as regards crosses, grounds, or freedom from foreign wire troubles?

(4) Are you in favor of it being abolished entirely for line work for voltages over 750?

As "safety to life" and "continuity of service" are possibly the two most important factors from a practical man's standpoint, the question, you will notice, covered these points only.

In all, 128 inquiries were sent out and a total of 65 answers received. The replies have been tabulated as follows: From Hydro municipalities, 45; from other municipalities, 9; other public service corporations, 11.

(1) In favor of weatherproof insulation from safety to life standpoint: Hydro, 39; municipal, 5; company, 11; total, 55, out of 65.

Not in favor of weatherproof: Hydro, 6; municipal, 4; total, 10, out of 65.

(2) Voltage limit for weatherproof: 750 volt, 7; 1,100 volt, 3; 2,200 volt, 21; 4,400 volt, 17; total, 48.

(3) Advantage of weatherproof from operating standpoint is covered by question No. 1.

(4) In favor of abolishing weatherproof for voltages over 750: 10.

It will be noticed that of the eleven companies that have reported, none are in favor of the bare.

Many instances were cited in replies received of the value of the covered as against the bare wire, and also several suggestions that weatherproof insulation be improved in quality and durability, but time and space will not permit of taking up these matters at this time.

In conclusion, it would seem that weatherproof covering for voltages over 750 is still in greater favor than the bare with men responsible for the construction and maintenance of overhead distribution systems in municipalities other than rural

JOHN J. HEEG.

C. W. ALFORD.

THOS. E. BELL.

J. W. COOK.

R. H. MARTINDALE,

Chairman.

DISCUSSION

Mr. Martindale

On behalf of the special committee appointed to go into the question of bare vs. weatherproof wire, I might say that our endeavors in this respect have only been along the lines of collecting the opinions of men who have had experience in outside construction. As we understood it, that was our commission; we were not going to go into the matter from any other standpoint outside of what experience has taught us, and we simply present to you in a few brief words just what we have gathered throughout Canada, from Vancouver to St. John's, N.B.

Report re Meter Inspection Tariffs

By Mr. M. J. McHenry

Hydro-Electric System, Walkerville.



At the last executive meeting you appointed a committee, consisting of Mr. E. V. Buchanan, London; Mr. O. M.

Perry, Windsor, and myself, to deal with the cost of meter inspection. Your committee met in London and discussed the matter, and it was decided at that committee meeting to draft a resolution to present to this convention, and if this convention sees fit to accept that resolution, it will be passed on to the Department of Trade and Commerce at Ottawa. In going into the matter of meter inspection it is apparent that the cost is at the present time excessive. The Act, as it reads, calls for the administration of the Department and the rate for inspection to be set to cover only the cost of such administration and the cost of the actual testing. As a matter of fact, the blue book published by the Government shows in the last nine years a surplus of some \$230,000 in connection with the electric meter inspection department. At the same time I believe it shows a deficit in connection with the gas inspection. Various bodies in connection with this Association have already communicated with the Department at Ottawa. I believe that various utilities have already sent resolutions to the Department at Ottawa petitioning or urging that the rate for meter inspection be reduced, and that the intent of the Act be kept in so far as the rates for meter

inspection are concerned. Some of the replies were considered rather unsatisfactory. The explanations offered were not very good, and, in fact, it was intimated that the blue book report was not correct. However, as we considered that the blue book is the last word in connection with this matter, the committee saw fit to base their resolution on the blue book report.

It was also decided at the committee meeting to communicate with the Canadian Electric Association and request them to take similar action to that which may be taken by this body. I may say that I have communicated with the Canadian Electric Association, but have so far received no reply from them. In fact, I have not received an acknowledgment of the letter.

I will read the resolution which was adopted by the committee.

"That,

"Whereas the Inspection Act, under clause 27, in regard to the regulation of fees for the testing of electrical meters, states that such fees shall be so apportioned that they will as nearly as possible meet the actual cost of effectually carrying on such inspection.

"And,

"Whereas the report of the Inland Revenue Department shows that in the past nine years there is a net surplus from inspection of electrical meters amounting to \$238,773.29.

"And,

"Whereas the rates now in force were designed some years ago, when conditions were vastly different from those existing at present, and as there will be an ever-increasing use of electric meters, with consequent re-inspection of same,

"Therefore,

"Be it resolved that, in the opinion of the Association of Municipal Elec-

trical Utilities of Ontario, the present inspection fees are much too high, and this Association therefore petitions the Department of Trade and Commerce to give the question of reduction in the rates of electrical meter inspection serious consideration, and to effect such reduction in keeping with the intent of the Inspection Act."

Address by W. M. Andrew



GENTLEMEN, I did not come here with the idea of making a speech. In fact, I did not understand I was to be called upon to address you, but I am very appreciative of the opportunity you have given me to say a few words, although I do not believe I am in a position to give our very much information in connection with the Association at the present time. I have only just been appointed, and really have not taken hold of the work or had an opportunity of discussing it with our various members to any extent. Both associations are at the present time in a formative stage, and have not laid down any definite policy as yet. Perhaps at some later date you may see fit to afford me another opportunity to speak to you, and, if you do, I will endeavour at that time to give you more complete information as to just what our purposes are.

I think, at the present time, about the best thing I can do is to read you a few lines from the constitution of the two associations. There are, as you know, two different associations, the Jobbers' and the Manufacturers',

and I occupy the position of joint secretary to both associations.

The manufacturers' constitution states: "Its object shall be to advance and protect the interests of the manufacturers of electrical supplies and of the manufacturers of materials entering into electrical construction, in manufacturing, engineering, safety and other problems, to promote the standization of electrical material, to collect and disseminate information, and to promote co-operation among the members."

The jobbers' constitution states: "The objects of the Association are to promote the welfare of its members and to distribute among them the fullest information obtainable on all matters affecting the electrical supply jobbing business. To aid in bringing about more friendly relations between the electrical supply jobbers and others engaged in the electrical business; to assist in standardizing and marketing high-grade electrical merchandise, and in reducing fire hazard; to improve the quality of electrical goods marketed by manufacturers, and the service rendered by the various branches of

the electrical industry; to encourage the manufacture of electrical goods in Canada.

I might also add that it is their intention to promote co-operation outside of their own membership, and in this connection let me state we are ready at any time to co-operate, either individually or collectively, with any of you in the electrical business in Canada, and I hope you will always see fit to call upon us when necessary, for we shall always be very glad to hear what you have to say and give it every possible consideration.

In conclusion, let me remark that Mr. Goodwin, who addressed this Association this morning, is a sort of guiding star in our organization, and what he has had to say has influenced us considerably.

In addition to the information which was chiefly gathered in Ontario, we have reports from eleven public service corporations. I have not mentioned the names of these companies in our report. Possibly I will do so when I have finished reading this.

In addition to that, I might say we thought it wise to go beyond the lighting and power side of the question, and we included in our enquiries the following companies:

The Canadian Electric Light Company (Levis, P.Q.).

The G.N.W. Telegraph Company (Toronto, Ont.).

The West Kootenay Power and Light Company (Rossland, B.C.).

The B.C. Electric Railway Company (Vancouver, B.C.).

The Bell Telephone Company (Toronto, Ont.).

The Hull Electric Company (Hull, P.Q.).

The Bell Telephone Company (Montreal, P.Q.).

The Ottawa and Hull Power Company (Ottawa, Ont.).

The North Shore Power Company (Three Rivers, P.Q.).

The New Brunswick Power Company (St. John's, N.B.).

The Quebec Railway, Light, Heat and Power Company (Quebec, P.Q.).

As I have stated, we have not attempted to do anything more than collect this information and present it to you. We felt that was all we were called upon to do. (Applause.)

Gentlemen, is it your desire that we do anything with this information that has been collected by this committee? I am sure they are to be congratulated on the way they have fulfilled their mission.

Mr. J. G. Jackson, Hydro-Electric System, Chatham:

I move that this organization adopt the weatherproof type of installation as the standard practice.

Mr. E. V. Buchanan, Public Utilities Commission, London:

Under present conditions the weatherproof wire may be the most suitable, but I think we reach the crux of the whole question when we consider that our present system is all wrong—where we have a maze of wires overhead of all voltages. We have to get rid of that system, sooner or later. In small towns I think you would find no trouble with bare wires, but when you get into large towns, where there are all kinds of overhead wire—perhaps two or three different companies' wires—protection is necessary. In the larger towns you

have to get away from the overhead stuff or get feeders or primaries, either underground or, as Mr. Schwenger showed on the screen to-day, suspended lead-covered cable.

Recently, while over in Europe, I took the opportunity to examine all overhead systems that came under my notice, and neither in England, Scotland or the Continent did I see one case of weatherproof wire; everything was bare. There, of course, the conditions are quite different. They have no maze of wires as we have here. In most cases where they used overhead wires, it was simply one circuit, and there was no chance of the wires becoming mixed. The weatherproof wire is absolutely unsafe, and I do not think this Association should endorse unqualifiedly the use of weatherproof wire.

Mr. G. Kribs, Hydro-Electric Power Commission, Toronto:

I might say that I have had considerable experience on the west coast and in Texas, and in both places there were distributing systems of bare wires. As far as those particular systems are concerned, one of them was at 6,600 volts, and there was no trouble whatever.

Mr. Wills MacLachlan, Hydro-Electric Power Commission, Toronto:

In connection with this situation, I think if a census was taken of the middle west States, where they are doing a great deal of construction at the present time, you would find that the standard construction there is bare wire for primaries. The weatherproofing of wires is simply fooling yourself. You are not insulating, and I would like to show that the utilities that report contains are not large

companies, and they are using bare wire themselves, but want other people to weatherproof them.

Mr. F. C. Adsett, Hydro-Electric Power Commission, Trenton:

I stated I was in favor of weatherproof for ordinary construction. We have been using bare primary three-phase wires in Trenton, and have had no trouble with it.

The President:

Is there a seconder to Mr. Jackson's motion?

I think we should either accept or reject the report of the committee. I will second that motion.

The majority seem to be in favor of weatherproofing, but I think, at the present time, the general opinion is to go ahead and use weatherproof without committing ourselves too strongly to it.

Mr. Buchanan:

I agree with that sentiment. This is a progressive organization, and there is not one man in the room who will not admit that weatherproof wire under many conditions is not safe. It may afford some protection, but we should be satisfied with nothing but the best. Every municipality is piling up a big surplus. What are you going to do with this surplus? I do not think we should reduce our rates any more. We should go on making the surpluses and invest them in getting a proper distribution system. The one thing that strikes me forcibly, on coming to Canada from Europe, is the most unsightly maze of overhead wires which destroy the beauty of our cities. We have

much more beautiful cities here than there are in the old land, but they are absolutely disfigured by these unsightly overhead wires. We should get to an underground system, especially in our down town districts, for our main primary feeders. If it is necessary, I would like to move an amendment to Mr. Jackson's motion that this matter be referred back to the committee for further consideration.

Mr. Fisk, Public Utilities Commission, Peterboro:

I beg to second that motion.

Mr. Jackson:

I am of the opinion that overhead wire in all the large cities is objectionable, and that underground wiring would certainly be preferable.

Mr. Buchanan:

Might I suggest that no action be taken on the report of the committee. Why need we endorse it?

The President:

I do not think you need to do so. I think your amendment is quite in order.

Mr. Jackson:

I am quite willing to withdraw my motion and substitute a motion thanking the committee.

Mr. V. B. Coleman, Hydro-Electric Power Commission, Port Hope:

There is one point that does not occupy the attention of a meeting of this kind. I have yet to come across a lineman who is in favor of using any thing but insulated wire, and we must not call weatherproof wire insulated wire. It does, however, afford some protection, and I am of the opinion

that people who have nothing to do with constructing lines should not have very much to say as to what is put up overhead for linemen to work with. I have yet to meet a lineman who wants to go up about 2,000 or 4,000 that wants those wires bare, except in a rural distribution, where there is very little need of men to go up, and where there are no trees or wires.

Mr. Buchanan:

The linemen should not have to go up among their wires with high voltages and handle them while they are alive.

Mr. MacLachlan:

Linemen will go up among them without rubber gloves and without shields.

Mr. T. E. Bell, Hydro-Electric Power Commission, Mimico:

I have had considerable experience with overhead line construction, and was one of the first men who ever cut out a 4,000-volt circuit in Toronto, and I have seen the so-called weather-proof insulation save three men's lives. We were phasing out on 4,000 volts, tying both circuits together, and the man above me made a false step.

The Toronto Electric Light System provide rubber gloves and rubber shields and afford the men every protection available, but you will admit that men going on 4,000 cannot always cut the system dead, and that is where the danger lies; I say this so-called weatherproof insulation is a protection to the men.

Mr. Krebs:

I would ask that this committee investigate the conditions in the United States for the purpose of getting information.

I think they should be asked to report on improved methods of dis-

tribution. I do not think we can really discuss this question properly under the heading of "Bare vs. Weather-proof Wire." I admit that under the present conditions it is better than nothing—half a loaf is better than no bread—but we don't want that; we want cake.

Unity is Strength

Address by Mr. A. Monro Grier., K.C., Toronto, President Canadian Electric Association.



R. President and Gentlemen,—I am not going to detain you long. In the first place, I doubt very much if it is a kind-

ness to keep men for a long time, after dinner, listening to a public speech, when the atmospheric conditions are not as desirable as they might be. I think I should make my speech correspond with my own stature, which, you will observe, is not a very long one.

First of all permit me to congratulate you, sirs, upon having your convention held in what is now the historic Clifton Hotel. I had to do with the company which was the predecessor of the one now responsible for conducting this establishment, and I would like, as one who has passed from that, to pay my compliment to those who are responsible for it at the present time, and to wish them, as doubtless you do with me, every success in their enterprise. Of course, in making that remark I impress in my thought at least, if not in my language, the actual meal we have eaten. I lay claim at times to certain spiritual tendencies, but I am

not so spiritually minded as to not have a proper regard for the dictates of the stomach, and I must say I have enjoyed the meal, and have not found it, as I have found many other banquets, so meagre that I was glad to get home to get some nutriment.

I am reminded once more of that occasion when the Right Honorable Joseph Chamberlain was to speak at a certain dinner in England, and the Mayor, presiding with rather more geniality than tact, said to the right honorable gentleman, "Will you begin now or shall I let them enjoy themselves a little longer?"

Now I am getting started. I want to commence, if I may, by issuing a word of welcome to you all, and in case that should seem a very conceited utterance, since you are my hosts and I am your guest, let me say at once that I allude to the district of Niagara Falls, and it is not unbecoming that I should speak in the language of one welcoming you under the circumstances. For several years my interests have laid in Niagara Falls. In Toronto I have a legal interest. I have two lines of defence. If any man comes to me with a legal proposition and says,

"Look here, solve that," I say, "My dear fellow, I am engaged in the electrical development work," and if an electrical man comes and says, "I wish you would explain this technical difficulty," I say, "My dear sir, I am a K.C."

I desire, as one connected with the company for a great many years, to extend a very hearty welcome. I do not use such a word as "Opposition Camp," but there have been different points of view by different bodies of men connected with the electrical industry in Ontario. I come to you to-night not as one in any sense hostile, but as one distinctly friendly and one whose attitude is that everything must be well, because it is always fair weather when good fellows get together.

It is not unbecoming on this occasion for me to mention that I have the honor of addressing you as President of the Niagara Power Company, and also as President of the Canadian Electric Association, and in both capacities I bid you welcome. If in these official capacities that is my attitude, what shall I say of my own—individually? This: That if by any chance there lies in me any modicum or residuum of ill-feeling or a lack of friendship officially, there is not one iota of that from my individual standpoint, and as A. Munro Grier I bid you hearty welcome to Niagara Falls.

Now, you may perhaps be wondering what I am going to say to you to-night, and I have resolved my doubts to a certain extent, and so that I may not forget them all, I have noted them roughly on a piece of paper, to which, with your permission, I will refer from time to time.

It may be that some of you may expect me to speak technically. That I shall not do. It may be that others will expect me to deal with matters more or less political, but that I shall not do. I have but one object, or perhaps two: First of all, speaking of you collectively, this, that your Association may grow and prosper, and anything I to-night may say will help to its growth and prosperity and not retard it. That of you collectively. Individually, my hope is this, that I, speaking as an older man to you all—certainly to most of you—may, perchance, say something which will be of assistance either in your business or in your private life. Not that I shall enquire into your official or private lives, but I shall hope that, by reason of some years of reflection of life and its philosophy, something may have demonstrated itself to me as useful which I, in turn, may have the honor of passing on to you. And so I thought I would say something to you to-night in the way of inspiration. It has occurred to me that, at this juncture in our country's history and in the history of the world, we must look for inspiration, for undoubtedly we have reached times that are hard and difficult from certain points of view. What inspiration can I communicate to you? You will be here for some days. What will you see when you are here? I charge you that you will get all the inspiration you should get from the works and wonders of Nature that you shall see. I am intolerant of the man who, coming to such a place as Niagara Falls, leaves it no wiser than when he came. It is the bounden duty of us all to gather something from the wonders around us and to

enrich our lives therewith. What will you find, not alone in Niagara Falls, but also in the history largely of the world, as written on the rocks which compose the boundaries of the river just below our seats? What may we not learn there as to the age of the earth, and not only that, but of the patience of Nature in the things she accomplishes. What will you learn of all that has taken place between the time these falls rushed over the Queenston escarpment until, by process of erosion, they reached their present site. If you visit the Niagara Glen, you will find now overgrown with trees the veritable bottom of the river in an older age. And the lesson, as I conceive it, to be learned by all of us from regarding such matters as these is something of the majesty of philosophy, the majesty of calm in storm, the majesty of repose when things are apparently against us, the majesty of patience in the working out of things not in a few passing moments or years, but down through the centuries. And if, perchance, at any time in your lives it may seem that things are not going as smoothly or as quickly as they should, that you are not reaching the goal before you as expeditiously as you desire, say to yourselves this—and in so saying you will render me greatest thanks—"On the 19th day of June, 1919, a speaker, laying no claim to merit as a speaker, yet suggesting that there was some merit in the thought, stated that you could have in matters of life such a splendid repose and patience as to make the passing ills of the day seem as nothing, and make you really bigger and better men." I really must be careful that I do not lay myself open

to the charge of having uttered a lay sermon. Please understand that I am not doing anything of the sort. I am speaking to you from a lower plane, or certainly one no higher than your own. I am speaking to you as one man to others, and uttering a few passing thoughts which conceivably will be of use and interest to you.

Now, what do you see here of the works of man, the completed work of electrical development? As I have played for 18 years a part of some importance in that development, it is obviously of good taste that I say nothing about it. I only suggest that it is perhaps a matter of inspiration to you to see what has been accomplished already in the harnessing of Niagara. I understand that on Saturday you will visit the work now in progress between Chippewa and Queenston, and I have no doubt you will marvel with me at the size of the undertaking and the magnitude of the conception of the plan, and speculate as to its final result. But I will not keep you with details as to that. I daresay, in any event, that each and all of you are better able to judge of such a matter than I am, but I make this remark, that, as representing the interests I do, I have no attitude of hostility towards anything that is for the good of the province or the country, but am absolutely in favor of everything that is for the real benefit of the province or of the country at large.

Now I am going to speak of another inspiration, which is not of to-day, but certainly was of yesterday, and in a sense is still of to-day, because only an armistice, and not a peace, has been signed. If you say to me, "We have heard enough of

war," I say to you, "In certain ways we can never hear enough of the war." I am not going to give you a history of the matter. I simply let you know my purpose in advance, so that, if I fail, you may see how greatly I fail. I suggest this thought to you, that the old adage of "Unity is Strength" is being fulfilled over and over again, and perhaps in this country has been fulfilled more than ever before in the history of the world. And that in this thought there lies a truth that the duty of man is to do his own work, and if we do our own work and recognize the value of unity, there is no question of the future success of this or any other association. What shall we choose from the war from which to derive inspiration? I point out to you the unity of the empire itself. You remember the time when Germany, amongst the idiotic things she did think, thought that the "colonies," as they were called, would not come to the aid of the old country. Fool! Why, what happened? Before the official declaration of war had been made, Canada offered her aid to England in the great war for freedom and the liberty of man. And they trooped from everywhere—from Australia, New Zealand, Africa, from the uttermost parts of the earth and the outlying parts of the empire, including the Boer chief and others under him. Mark the difference. In 1870, 44 years before this present war broke out, Germany had conquered Alsace-Lorraine, and yet in 1914 there was a bitterness and a hostility towards Germany on the part of the Alsatians that nearly half a century had failed to eliminate. In the case of the

Boers, however, with whom England had been at war just a few short years before, what did we find? They allied themselves with the old country, and their attitude was one of comradeship, of friendship. In truth, the fact is that these bonds which bind the various portions of the empire together, which are so thin you cannot touch, you cannot handle, you cannot see, these things which are so fine materially, spiritually are so strong that not the steel of the greatest strength can by any possibility attain to their coherence.

We had a unity not only amongst the nations composing the empire, but amongst the several branches of the service, and I want to allude to this here, because I understand that members of this Association and their relatives went overseas. In fact, there is no household in Canada or any part of the British Empire today that has not had some association through their relatives with this war. And just for a moment let us see the extraordinary unity that prevailed amongst all ranks and all branches of the service. The Army fought cheerfully with the Navy, and both cheerfully with the Air Service, and with them all co-operated the women of the empire, in their several places, all with one object in view—absolute unity. It mattered not one whit what was the religion of any man, how high he was amongst the officers or how low he was in the ranks, all were the same, whether in the Army, the Navy, the Air Force, or elsewhere. And not only were the official soldiers and sailors fighting, but we had that tremendous navy of fishermen, who, hitherto devoted to peaceful pursuits, aban-

doned them in order that they might carry on for the empire and for freedom—all showing the marvel and beauty of unity. Can you imagine any finer situation amongst the Allies than their voluntary subordination to that magnificent French officer, General Foch?—careless of their own particular standing, all united under him in order to win the battle!

Then look at the wonderful co-operation in the navy. You remember how the American navy went forward and co-operated with the British navy, the officers and men subordinating themselves to the ranking British Admiral. Why? Because they were not concerned with showing their own individual exploits, but with proving to the world that the Hun was an abominable beast and that Germany could not rule the world, and that freedom must.

Now let us glance at our own problems, and ascertain, if we can, what is best for us in these trying times. Peace and goodwill was that splendid message of old, and peace, I trust, we shall shortly have, and now to get the goodwill! That is really the important thing in all our activities in life. If you get enough men of goodwill banded together, they can accomplish anything for good. For myself, though I admit my obscurity, I do claim I have goodwill, and if I meet any man, I care not of what rank, or camp, or association or interest he is, provided always he is a man of goodwill, I shake hands heartily and wish him God-speed in any venture he has for good. And this should be the attitude of us all. Your action to-night

demonstrates that it is possible to have one from another interest speak to you in a voice not unfriendly, but in such a way as to suggest that he was one of yourselves. So I charge you to give me the thanks of bearing in mind just the outlines of what I have said. Please remember more than ever the vast wonder and splendor of unity. Sometimes when I walk into a great powerhouse and contemplate the majesty of a generator (which is obvious to you) and think of the little things in the wheel-pit (which I and some of us present know about), I reflect on how we all see the things of splendor and ignore the humbler. Yet the generator is dependent on the little things in the wheel-pit, and were the small thing in the wheel-pit to say, "I shall no longer act as a wheel, bolt or nut, but would rather be a generator," and do its best to carry out its desire, it would show it was an uncommonly bad nut or bolt, and that is something we have to learn.

Contemplate for a moment such a majestic character as Abraham Lincoln. Some people have the notion that the great point of his life is to demonstrate that a man of obscure beginnings can become President of the United States. That, perhaps, incidentally is taught, but it is not the main lesson. The main lesson of his life is that, whether a farmer or an obscure lawyer in a western town, in each and every position we must do our duty, and it is on that account that, after the elapse of so many years, the world still rings with the applause of that tremendous, splendid man, Abraham Lincoln.

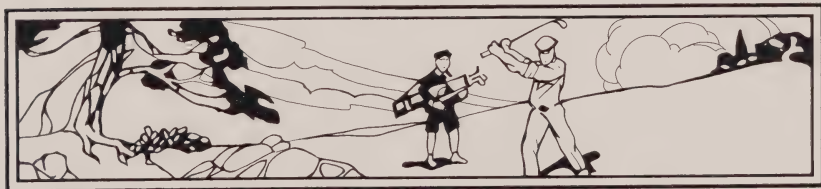
If someone should say to you, "What did Mr. Grier say to you that

evening?" please be kind enough not to say "He said nothing whatever." Please do not say I only made sounds which entered into your ears and did nothing more. I am very much concerned about getting this simple lay message directly into your consciousness, but I daresay you feel it is quite time I concluded, and I think so, too, and I am going to obey the injunction of someone who said to a man who did a great deal of public speaking, "When you have finished, sit down quietly, lest you awake the sleepers." Just bear that thought in mind as to each doing his duty. May I give you an illustration as to unity? Perhaps you have heard this before, but it is worth hearing again. Do you ever have in your mind what is causing this light to shine, these electric cars to run, these electro-chemical places over the river to do the wonderful work they do? May I interrupt myself to say this, that perhaps no place played a greater and more significant part in the war than Niagara Falls, because we were sending such a tremendous amount of stuff to Europe for the allied armies. Why is Toronto and all of the province engaged in vast manufactures? Simply because a certain

number of individual drops of water are falling down a certain given space. That is the whole thing. I ask you to consider what would be the effect if you drop one drop of water to-day and another drop to-morrow and another the next day? Absolutely no effect. The effect is wholly produced by means of unity, by the drops falling down together, and in that we get probably the most majestic conception of man's handiwork to be found in the civilized world.

In conclusion, let me quote Tennyson's beautiful lines written to the late Queen Victoria during her reign, and let me suggest that we apply the spirit of the language to our own councils, and thus secure better results:

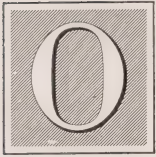
"And statesmen at her council met
 Who knew the seasons when to take
 Occasion by the hand, and make
 The bounds of freedom wider yet.
 "by shaping some august decree,
 Which kept her throne unshaken still,
 Broad-based upon her people's will,
 And compass'd by the inviolate sea."



Routine Handling of Consumers' Accounts

By R. C. McCollum

Auditor Municipal Accounts, Hydro-Electric Power Commission of Ontario



IN planning a system for handling consumers' accounts of a Hydro Electric Utility, there are several principles of so outstanding a nature that they must be recognized and the system built around them. Briefly, they might be given the following relative importance:-

- 1st.—The record should be concise, but in sufficient detail that any error in the monthly bill can be promptly detected, or any complaint of a customer can be intelligently discussed without going back to the meter card or any other record.
- 2nd.—It should occupy the minimum office space and in its operation be as noiseless as possible.
- 3rd.—It should be accessible to any number of clerks at the same time.
- 4th.—The index should be rapid and definite and should provide for unlimited expansion.
- 5th.—It is especially desirable that when used in Hydro offices where a uniform system of rates is in force throughout the Province, the forms should be uniform, to secure the greatest measure of economy in installation and renewals.

6th.—It should be possible to examine the charges for any particular class of service without disturbing the balance of the accounts.

7th.—The records should be so kept that representatives of the Hydro Electric Power Commission can, in the minimum time, extract from them such information as is necessary from time to time, to check the actual working out of rates and modifications of same as is required by the provisions of the Power Commission Act.

A careful survey of the situation and a study of the practice of Public Service Corporations here and in the United States lead to the selection of a card system as most nearly measuring up to the requirements and so far as I know there are but three Hydro municipalities in the Province of Ontario where the Card System has not been adopted. This does not include municipalities connected to the Central Ontario System in most of which registers are still in use.

The adaptability of card records to the requirements generally, will be admitted by all who have used them. Under the old system of rates, consisting of a straight K.W.H. charge with possibly a fixed meter

rental, the old fashioned register, though clumsy, answered the purpose. It required the exclusive use of a large desk and could be worked on by but one clerk at a time. If, as was usually the case, every alternate line was left blank to accommodate new accounts, the register was extravagant in the use of paper and the number of leaves which had to be turned in posting. It also had to be re-written each year, a task looked forward to with dread from about vacation time. As a rule all the information it contained was the gross and net charge, and date of payment, and the only way the billing and extensions could be audited, was by checking back to the meter records something that in practice was rarely if ever done.

A card ledger, properly kept, can be made to give an amazing amount of information. The color scheme generally used, shows readily the number of domestic light, commercial light and power services. By the use of an offset or a tumble card, the daily postings, both debits and credits, can be check posted, and, where a control account is kept, the office can be closed each night with that satisfaction, so dear to every real bookkeeper, of knowing that his accounts are in balance. Where the cash is check posted to the cards, as is usually done, without the use of a control account, these tumble cards can be used to indicate debit balances, so that a Manager can run his eye over his card trays any day in the month and pick out every account in arrears, without examining or even touching another card in the tray.

The average Manager of a Hydro System will admit that the matter of arrears is about the least of his troubles. It is not at all unusual for records to show not over two or three per cent. of accounts in arrears,—and I have one municipality in mind where for three consecutive years the books have been closed without a single account in default. Such conditions could never obtain where Managers had to pore through hundreds of pages of ledger or register to draw off delinquent lists.

It is the universal practice in even the smallest municipalities to keep the consumers' accounts in meter reading route order. The advantages of this are too obvious to need explanation, but there is much difference of opinion as to just how far this system should be elaborated.

With the exception of a few of the very largest municipalities, it was the practice, until quite recently, to send the months' bills out at one time, approximately the first of the month, with a uniform discount date, thus crowding into about fifteen feverish days the work that should have been spread over the entire month. About the only advantage of this plan was the impression which was conveyed to the citizens who usually called at the office once each month on "fever" day to pay their bills, that it was the busiest and best organized office in the town, an impression usually very far from the truth. It is with these two phases of office routine that I wish to deal.

In all municipalities large enough to require the services of a meter reader for over six days a month, continuous billing should be inaugurated, and an arrangement of cards and numbering adopted to facilitate this plan.

Where the meters can be read by one man in less than a week, a fixed billing and discount date is probably the best plan. All that is necessary is to make out a meter card for each consumer and have the meter reader, assisted by someone who knows the town thoroughly, number the cards from one up, in the order in which they will ordinarily be reached, leaving blanks for vacant or unwired houses, vacant lots, or any district where additional accounts are likely to develop. Another plan is to leave every second or third number blank, according to the district, alternating from odd to even numbers, so as to use approximately the same number of cards of each tab. Either of these plans will work satisfactorily, if plenty of blanks are left, and blank numbers cost nothing. Our experience has been that when the cards are rewritten at the end of two years, the re-numbering at that time is practically permanent. A large number of excess blanks is preferable to the use of fractional numbers or an initial affix.

In larger municipalities where continuous billing is advisable, the area should be divided into from ten to twenty-five districts, according to the size of the city. This can best be done by marking off on a large scale map, in colored ink the districts decided on. This should be very carefully done, commencing

in the center of the City and working out, making each district small enough that the meter reader ordinarily can cover it in three-quarters of his working day, leaving a comfortable margin to take care of pickups, re-check apparent errors, and catch up delays due to holidays, sickness or accident.

Where it is proposed to have the meter reader deliver the bills, and the districts are made small enough to be read in the forenoon, it is quite practicable to have the bills delivered in each district on the afternoon of the day following the reading, and the pickups taken care of at the same time.

With the possible exception of the main business streets or where for lack of paving the meter readers are unable at certain seasons of the year to cross at will, it will be found best to draw the district lines on the map so as clearly to include or exclude the street. There need, of course, be no outside limit to the last row of districts which extend to the present city limits.

On the map, each district should be numbered boldly in the center. Each street in each district should be given a sub-number, commencing at No. 1, as nearly as possible in the order in which the meter reader will reach them. No attempt should be made to give one street the same number in two or more districts unless the numbers fall naturally.

With the aid of a City Directory you can now, if desired, mark on the map the house numbers at the district intersection of each street, or this information can be placed in a small card index in the following

form for each street and filed alphabetically:—

Queen Street	District	Street
1—137	1	1
139—230	3	2
231—End	7	4

As each consumer is given a permanent number consisting of his district, street and house number, when Mr. Smith signs an application and contract and gives his address as 87 Queen Street, you immediately register his contract and ledger card 1-1-87 with no fear of duplication or conflicting numbers. Of course the number belongs to the house or service and will pass to Mr. Smith's successor if he should vacate.

The contracts are naturally filed alphabetically and afford a perfect index to the ledger account at all times, but in actual practice it will be found that the customer who mislays or forgets his bill can usually remember where he lives and with this information the clerk can find his ledger card in the tray in less time than the contract or index card in the alphabetical tray can be located.

This system is permanent and perpetual, and allows of unlimited expansion. The only difficulty to be encountered is business blocks and apartment houses, which if small can be keyed alphabetically, or if large, can be given a number same as a street, which is practically what they are.

Of course there are other ways of securing meter readings. I recall our first visit to a large Hydro city where they were getting along without any meter cards. The con-

sumers' accounts were kept in loose leaf ledgers, one name to a sheet, and they well nigh filled a room. Each day a clerk went through a section of these ledgers and wrote on little slips about three inches square the name and address of the consumers whose meters were due for reading, and these slips were handed to the meter readers. The next morning the meter readers turned in all the slips which they hadn't lost, with the readings, and it was the duty of the office boy to put these slips back in the ledgers beside the customers' account, leaving one end protruding as a marker. Then the billing clerks made out bills for all the accounts so marked, and charged the ledger account accordingly. If the office boy lost the slip, or shoved it in too far, or if it fell out, or if the meter was in the attic, or the customer kept a cross dog,—no bill went out for another month. Hundreds of customers were not billed for periods running from six months to a year, and as with such a system no follow up scheme was possible, the ledgers contained literally thousands of dollars worth of bad accounts which were finally written off as uncollectible.

Various styles of billing forms are in use, the size and form varying according to the personal preference of local officials. A standard form is stocked by the Commission and is used generally by the smaller municipalities, but in towns and cities the bills should of course be printed locally, and should carry the address and office hours. Where the bills are sent out at one time, a vast

amount of writing can be saved by having the printer set in the date and discount period, changing the month when approximately a month's supply is run off. A few extra bills left over each month is a small matter, and a shortage can be made up from extra blanks, and in addition to the saving in writing, the bills present a neat and business-like appearance. In some offices it is the practice to alternate the colors each month, a plan which does not cost anything and very frequently prevents the inadvertent allowance of discount on a last month's bill.

In all offices where there are one thousand or more customers the bills should be numbered and addressed with an Addressograph or some similar device.

With such a machine a clerk in a few hours will do with neatness and accuracy work that would otherwise require days of laborious copying.

The fact that bills are headed for every account is a constant check against record cards being out of the cabinet, and insures against errors in address. Where bills are sent through the mails, the address should be so placed that window envelopes can be used. A perforated envelope costs about half as much as one with a transparency, and is much more efficient.

When addressing machines were first introduced, the saving in time and labor was so great that it was considered no hardship to make the same impression on both the bill and stub,—but we now find that by placing the account number at the right of the address, so that it will fall on the stub, and the name and

address on the body of the bill, a single impression is all that is necessary, thus affecting a further saving in this work of approximately 30%.

Bills with perforated stubs should be so prepared that the figures on the stub will be placed on the extreme left, immediately adjoining those on the bill itself, so that both sets of figures are visible without changing the focus of the eye. This will practically eliminate transposition of figures, and ensure the stub carrying the same figures as the bill. Errors in stubs have caused many an hour's work with a cash drawer that would not balance.

It is generally admitted that a running detailed record of cash receipts should be kept in every well organized office, although in many offices the stubs are simply run through an adding machine after posting, and filed with the listing slips wrapped around them. I have had considerable experience balancing ledgers where this practice was followed, and where so many bills are for the same amount the slips are of no use in checking, even when they can be found. I consider the practice slovenly and altogether undesirable. The daily listing of the stubs in a cash book, using the account numbers instead of the names, is not a formidable undertaking and leaves a record for the Municipal Auditor of which the Manager need not be ashamed.

By using a split adding machine, the cash book may be entirely prepared mechanically and added at

the same time. A single split will give all the information necessary, even where a complex account number is used, by placing the district number at the head of each list on the non-add side. Such cash books are in use in a large number of municipalities and are giving general satisfaction, affording a neat concise record in a very limited space.

In one police village an enthusiastic Trustee undertook to do all the clerical work himself, and when we called at the end of the year to close the books, we were handed the meter book and the pass book. In this case it was actually necessary to call on every customer in the village and examine their receipted bills in order to secure data on which to build up a cash book.

The foregoing outlines the plan of handling consumers' accounts which in whole or in part is in use in every Hydro municipality in Ontario. In general efficiency I feel it is the equal of any system in general use, and that the average cost is at least fifty per cent. less than that of public service utilities using cumbersome ledgers or registers and passing the charges and collections through a control account which in many cases is thousands of dollars out of balance, and where, after the adoption of continuous billing, the proof of balance is practically impossible. I have in mind two Hydro municipalities where the accounts were regularly audited by chartered accountants of recognized standing but who made no effort to justify the control account although in one

case it was known to be over three thousand dollars out of balance,—also another city where the five billing districts were handled through five separate control accounts, and where one clerk was assigned exclusively to keeping these accounts straight although there was practically no possibility of any actual shortage in the cash which such a check could detect as the collections were made in another office,—and of still another case where an auditor was paid a special fee of \$2,300.00 to re-check his previous work and locate discrepancies in the control account amounting to \$3,500.00, although in this case also there was no thought of locating any missing cash or increasing the revenue.

It seems a far cry back to the early days of Hydro when one Manager made his collections personally, entering them in a loose leaf pocket memo which he destroyed as soon as the items were posted in his ledger. It was the most satisfactory customers' ledger I ever saw as every account was kept balanced by the simple expedient of never making any charges until the collection was entered. As it was a flat rate town with no meters, and the Manager varied his charges from month to month according to the amount he thought they ought to pay, there wasn't much work for the Auditor unless something had destroyed his faith in his fellowman. I also recall two other municipalities where the Secretary kept an ordinary receipt book on his desk, and carefully filled one out for each customer, completing the stub for his own record.

DISCUSSION

Mr. A. R. Porter, Addressograph Sales Co., Toronto:

I think Mr. McCollum has covered the points of the addressograph very completely. I would like to make any remarks I have to make in the exhibit room downstairs.

Mr. A. L. Whitelaw, Burroughs' Adding Machine Co., Toronto:

I am afraid a good many men have, as an idea of system, an elaborate system of files, ledgers, special indexes, and so on, until the office is piled up with an accumulation of things that require another system to handle. But I can congratulate Mr. McCollum on the paper he has read this afternoon, because I believe he has a real system for the handling of Hydro accounts, and when I say "a real system," I mean he has arranged in the simplest possible form a method of arriving at the results desired, and I think that is what system really is—a boiling down of the office routine to the simplest form possible. A few years ago, when I was in the adding machine business, we had great difficulty in obtaining a hearing in the offices of even the largest municipalities, and so it is an indication of our progress when this Association invites us to come here and let you know what we can do for you.

I do not think I can add anything further by way of comment on the paper, but I shall be glad to answer any questions members may care to put to me while examining the exhibits in the rooms below.

Mr. H. P. L. Hillman, Toronto Hydro-Electric System:

Mr. President and Gentlemen,—Mr. McCollum is to be congratu-

lated on his paper, which seems to me to cover the principal points of billing methods in an efficient way without going too greatly into details. I am forced to agree with Mr. McCollum in a good many of his statements. I think the day of the old-fashioned register, with 50 or more different consumers' accounts on the one page, is properly going into the discard. The continuous method of billing which he advocates in municipalities of over 1,000 accounts is proving by experience, in the case of large concerns, to be the most desired.

The point Mr. McCollum brings up in connection with the marking of the house numbers on the map is a good one, and I would elaborate that a little further by saying that houses on the street corners should be definitely marked to show what the street number is.

Mr. McCollum mentioned that various styles of billing forms are in use. Municipalities, in issuing bills, should always be very careful to see that the name of the municipality is on the bill. We frequently get cheques in our office with the bill attached to them, but on which no municipality's name appears. It was "Hydro," and the customer thought it must belong to us.

I want to commend the addressograph and any similar addressing system. One point Mr. McCollum might have mentioned in his paper is the fact that it serves as a check on seeing that every customer is billed. He mentioned a case where a customer might be billed or not, just as the man in the office decided. But if an addressograph plate is made for every contract signed, that addressograph plate is used immediately to

print the ledger card and the index card, and the plates are kept in separate files, and the bills are handed to the addressograph clerk every day, and the cast-iron rule is made that every customer whose name is filed shall be billed.

I also agree very cordially with Mr. McCollum in his suggestion that, even though it may seem a little extra work, detailed records of cash receipts should be written up. We have a night staff that take the stubs from the teller, and the cash book is written up in accordance therewith. There is nothing so satisfying to the customer, when he comes into the office, that, although there is a great, big business there, with a large number of customers, he can be shown a detailed cash book and told, "There is the amount of money you paid us" on a certain date. The fact that you have a definite chronological cash book, enabling you to keep records in a businesslike manner, will perhaps convince him he is mistaken.

I must confess I am not altogether in favor of a card ledger for very large offices. It is true that loose-leaf ledgers take up a good deal of room, but I do not see why our business is not just as important as the banking business, and it is only in the last few years that bankers would consider the loose-leaf ledger at all. They have been gradually converted to it. The card system is very easy as a matter of reference, but also very easily lost,

In his foreword Mr. McCollum has stated that the card ledger should be accessible to any number of clerks at the same time. Well, if your office staff numbers half a dozen and they all go to the card ledger together,

there is no reason why a card should not be lost. I am frankly in favor of loose-leaf ledgers kept in a locked binder, although we do use card ledgers in some of our subsidiary bookkeeping, as, for instance, where there are not very many accounts to be handled, and they are thus easily replaceable.

I do not altogether agree with Mr. McCollum when he (as I would put it) deprecates the necessity of a trial balance being taken from the ledger cards. We have over 100 ledgers and about 52,000 accounts, and we take a trial balance off those ledgers every month. The end of the month charges do not get into those ledgers until about the 7th or 8th of the next month, because we include the bills for the meters read on the last day of the month in that month's working. In the case of the meters read on the 31st May, it is not possible to get them out before the 5th or 6th June; so that means that ledger is not posted until the 5th or 6th June. Every one of those ledgers was balanced by the 20th June, and we carry a general controlling account in the general ledger, and subsidiary controlling accounts for each of these ledgers, so when the ledger keeper takes off a trial balance he knows right away which ledger is out of balance. I do not think a public accountant would be justified in certifying to the customers' balance in which the balances were not verified by a detailed trial balance. He should have an opportunity of seeing whether they are bad debts or recent bills. If banks require trial balances for their ledgers, I do not see why we should not require the same. You can do too much checking, but at

the same time a certain amount of checking should be done to see that the accounts are right. If you are going to balance up the operation ledger, the construction ledger and the appliance ledger, I do not see why you should not take out a trial balance for the customers' ledger. However, Mr. McCollum has touched upon all the main points, and has certainly presented to us a really up-to-date method of handling consumers' accounts.

The President:

Mr. Hillman, has your ledger a separate sheet for each account?

Mr. Hillman:

A separate sheet for each address.

The President:

In other words, it is a card system bound in a book?

Mr. Hillman:

Yes.

Mr. M. J. McHenry, Hydro-Electric System, Walkerville:

Mr. President and Gentlemen,—I am sure Mr. McCollum's paper has been of interest to everyone, and the system he outlines for the average Hydro municipality is one which will not only prove efficient, but which is, on the face of it, fairly simple. There are one or two points in connection with the various features of this system which I thought might be of interest to various utilities. One is in connection with the use of the addressograph. We have been using the addressograph in Walkerville, and up to the end of last year we found it fairly satisfactory, but we were having new plates made in Toronto and found it impossible to

keep the addressograph plates in accordance with the ledger cards. I might say that our population is rather a shifting one. People are always moving from one house to the other or away to Windsor or Detroit. Consequently, we have a large number of changes to make in the addressograph, and we found it paid us to buy a companion machine to the addressograph, known as the grapho-type machine, and make our own plates. I think in any utility where the population is moving rapidly and changes are continuously being made, it would pay that utility to do the same thing, and make their own plates. In that way plates can be made for new customers or changes can be made the day following the application being taken in, and the addressograph plates will always agree with the ledger cards.

Mr. McCollum has mentioned one thing in connection with bills being sent through the mail—that window envelopes can be used. A few months ago I ran into something which I do not think has been brought to the attention of other utilities, or to the attention of the Hydro Commission itself, in connection with the using of window envelopes. We use the color system for the different classes of accounts—white for residential, pink for commercial, and yellow for power—and we were using a white window envelope without transparency. The postmaster very kindly called my attention to the regulation which states that the envelope must be the same color as the bill. That is, if you are using a yellow bill, you must have a yellow envelope, and also the fact that no color shall be used for

any bill which makes it difficult to read the address put on either by hand or by addressograph. For instance, some colors of ribbon might give you on a blue-colored bill a very faint impression or an impression rather difficult to read, and the post office, in accordance with the regulations, can refuse to accept any such bill.

In connection with the use of the adding machine for cash book entries, I think that it could be used by utilities very successfully. It has been used by the Walkerville Commission for a year and a half and has proved very successful. Previous to the use of the adding machine for the listing of the accounts in the cash book, the cashier's full time was taken up in taking in the cash and making entries in the cash book. After the installation of the cash-book system where the addressograph was used, we found that the cashier had from two to three hours a day to spare to devote to other classes of work, and in that way we were able to get considerably more work out of that particular employee.

Mr. Hillman made the point that he is not altogether in favor of the card ledger system on account of the fact that there is a liability of cards being lost. Of course, I am not familiar with what would happen in a large system where they have something like 52,000 accounts, and there is a possibility of cards being misplaced from time to time, but we have approximately 2,300 account cards (we are using the card ledger system), and I may say that in the last year and a half, to my knowledge, there has never been one card misplaced

or lost. We make it an absolute rule that only the billing clerk or the cashier himself may take cards out of the file; any other employee must leave the cards in the file, because they can be seen, and any information necessary taken from them without removing them from the file; in that way the possibility of losing ledger cards is to a large extent avoidable.

I am sure Mr. McCollum has given us a paper which will be of considerable interest and value to all the members of this Association.

*Mr. J. W. McLean, Lowe-Martin Co.,
Toronto:*

I think most of the members here know our firm, and when Mr. McCollum originated the idea of the card ledger system for municipalities, we were glad to afford him any suggestions we could, such as colored tabs, and so on. That system is now being used in 90 per cent. of the municipalities, and we are glad to say we are pretty well favored with business.

I would like to mention, in connection with the loss of cards, that the banks at one time did adhere entirely to bound books, but they found they took up so much room and time, and so they eventually adopted the loose-leaf system and now they are using cards.

I think Mr. Whitelaw mentioned that there are banks using cards with machine posting ledgers, and the banks in the United States are using cards right through.

If they do lose a card, they can easily find it out, because they have a register, and if they cannot find the card that is lost, it is a matter of looking up the last trial balance and

making out a new card, but I have no knowledge of a card being lost, although I have known of a card being taken out of a file by a rival bookkeeper because there was a rivalry in the matter of getting the balance out first. The other man, however, was able to get the last trial balance and get the present balance off just the same.

Mr. W. H. Childs, Hydro-Electric System, Hamilton:

After all, it seems to me that, in rendering the accounts, there are only two points that must be considered—service and cost. With the system outlined by Mr. McCollum service can, no doubt, be given, but cost also enters into the question. He suggests giving the meter reader three-quarters of the work he got. Of course, you are losing 25 per cent. efficiency there, and I question very much whether it is advisable to lose that 25 per cent.

There is one other question in connection with that system. He says it allows for unlimited expansion. Personally, I cannot see how that works out. If you divide the city into 25 districts and you are extending almost entirely east, as we are, how are you going to allow for the expansion. We are extending to-day at the rate of about 2,000 consumers a year, and we must allow for that, but that will be overcome in a short time.

I would also like to suggest that perhaps it might be advisable to use a letter instead of a figure in the description of the account. That is, instead of "1-137," to point "1-A-27." Very rarely will you have in one district more streets than you can accommodate, and that would do away with the (dash-dash) between

the letters. This system has been used entirely in connection with the war maps of the British and Allied Governments, where they use a number and a letter to designate a certain position. They find that more satisfactory to avoid continuous numbering.

I asked Mr. Porter to come in and show us where we could save money, but he did not succeed in doing so. It might be advisable for the different managers of the Hydro Systems to compare their costs per consumer per annum for billing. It is nice to get a trial balance and to know just where you are, but if it is going to cost you \$2,500 or \$3,000 a year to save \$200 or \$300, I question that.

Mr. Hillman also mentioned the question of losing a card. We have been using the card system for the past seven years, and we also have a meter-reading card, and if the billing card is lost it is immediately discovered by the fact that the meter card is there, and there is no place to post the meter record to. We have now over 18,000 consumers, and have lost one card, and I have not found out whether some jealous clerk took that card or not, but we did lose it.

Instead of the cash book (as Mr. McCollum knows), we have a duplicate account. We don't use a stub. We have a duplicate account made out with carbon paper on the typewriter, and instead of the cash book we have those duplicates bound; they are our cash book.

Mr. Hillman points to the fact that it is very nice to show to a customer an entry in a book, and say, "You paid so much" on such and such a day. We can actually show a duplicate for the accounts on that date,

and can say "There is the account you paid on that date." We have a double check in everything that goes through our office. Of course, we can put through four, five or any number of checks necessary, but I think it is generally considered good practice to have a double check.

The two things to be borne in mind are service and cost. Service is first, but there must be a reasonable limit, or otherwise you could say, "Why not ten checks to see that everything is absolutely correct?" and we don't use the cash book.

I think Mr. McHenry is mistaken in regard to the post-office regulation. As I read it, it is that that portion of the enclosure must be white or of a light color. We have been using white bills for residence, blue for commercial, and yellow for power.

I think Mr. McCollum's paper is a particularly clever one, and it has afforded me very much pleasure indeed to have heard it and also the discussion thereon.

Mr. A. E. Clark, Hydro-Electric Power Commission of Ontario, Toronto:

In connection with Mr. McCollum's paper, I would say we are using the very latest form of loose-leaf ledger. A town of 2,500 customers will not have more than 100 pages in a ledger. I do not think we would consider that very cumbersome, especially as loose-leaf ledgers may be made to contain any number of pages and may have any number of binders you wish.

I would like to call attention to some of the statements made in the order in which he mentions them, for the purpose of bringing out the other side of the question, and to point out in what way the ledger fulfils the con-

ditions which he lays down as being fundamental. I would like to do this for two reasons—first, because I would not wish local managers of the Central Ontario System to feel that they are using records which are out of date, and I would not like the managers or representatives of the utilities which are already owned locally to think that the Commission is recommending to them the use of a system which it does not put into force in the case of accounts controlled by itself.

In the first place:

"The record should be concise, but in sufficient detail that any error in the monthly bill can be promptly detected, or any complaint of a customer can be intelligently discussed without going back to the meter card or any other record."

The register is very concise in that it does not show any information which is not absolutely essential, but, at the same time, we are of the opinion that it shows all essential information, both from the viewpoint of the local office, the engineer, the bookkeeper, and the auditor; the rate of consumption is shown; practically the only thing which does not appear in the register which appears in the cards is the meter reading, and personally I do not think that that is necessary in consumers' accounts, seeing that you have it in a meter-reading card, and do not in very many circumstances have to turn it up.

In conversation with local managers I have found that not more than 2 per cent. of our accounts have to be discussed in any one month with a customer, and, therefore, it should not be necessary to do a certain class

of work for 98 per cent. of your customers which is not going to be of use.

"2nd. It should occupy the minimum office space and in its operation be as noiseless as possible."

I do not think such a ledger as I have described occupies any more space than a card ledger, and it is very easily handled.



"3rd. It should be accessible to any number of clerks at the same time."

I do not think that the card ledger is inferior to the consumers' ledger in large offices, but, I think, in offices which have 3,000 or less, the register is more economical, because it takes less time to handle it, and by being subdivided into different books it is accessible in offices of such size to all the clerks who are likely to use it. In most cases it can be handled by one clerk, or two at the utmost.

"4th. The index should be rapid and definite and should provide for unlimited expansion."

Since the consumers' ledger is written over every year or two, it seems to me that question is not perhaps so important, because lines can

be left for vacant and unwired houses, and street numbers can be skipped in localities where building is apt to be carried on in the near future. In a great many of the smaller towns there are no street numbers, and, therefore, the register gives a perfect index, and subject indexes, either alphabetical or such as are mentioned in Mr. McCollum's paper, can be used equally well in connection with the register.

"5th. It is especially desirable that, when used in Hydro offices where a uniform system of rates is in force throughout the province, the forms should be uniform, to secure the greatest measure of economy in installation and renewals."

In regard to the cost of forms, I do not think there is very much difference. In the case of the loose-leaf ledger, the binder will last for some time, and all you need to do is supply new sheets. In our registers we have a narrow sheet for the names and a wider sheet for the financial information, various columns being provided for the different kinds of revenue. Since we started operating, we have had practically no trouble in keeping the ledgers in balance.

"6th. It should be possible to examine the charges for any particular class of service without disturbing the balance of the accounts."

If there is more than one ledger, it should be quite possible with the consumers' ledgers as with the cards, and they have the advantage of everything being in front of the reader, who just runs his eye down the page to get all the information he wants. Supposing a town had 2,000 customers and the manager wanted to scrutinize the accounts, to get an


idea of how they were being handled? Those 2,000 could be handled in the one ledger, which could easily be looked over in one hour, whereas I would think it would take nearly a whole day to look over 2,000 cards.

"7th. The records should be so kept that representatives of the Hydro-Electric Power Commission can, in the minimum time, extract from them such information as is necessary, from time to time, to check the actual working out of rates and modifications of same, as is required by the provisions of the Power Commission Act."

I think it is also necessary to consider that the accounts should be kept by the ledger keeper in a manner which will keep the cost within a reasonable limit. We do not have to re-write the ledgers every year. There is a separate sheet for the names, but as soon as that sheet gets full or there are many changes in it on account of customers changing their addresses, that one sheet has to be re-written. However, at the end of two years, should the register require to be re-written, by the use of the addressograph the whole of the names and addresses can be put in in one day or two days at the least. I tried this out myself in the case of one or two sheets, and I am convinced that, by using the addressograph, the annual re-writing of the ledger will no longer be looked forward to with any apprehension.

I think Mr. McCollum made a good point about the billing system. The recommendation which was made contained several points which made it seem that the customer's money is received ten days approximately after the bill is sent out, and

in the case of the Central Ontario System that would amount to nearly \$1,000 a year in interest.

In the case of those towns which have been using the continuous billing system, there is no desire to go back to the old system. The Commission is putting addressographs in those offices where there are enough customers to make it worth while, and we find it nearly as expensive a proposition as the first, but the advantages are very marked. The metal plates provided are very easily changed, and if the customer moves, you simply move the name from one location to the other. We have in a town of 2,300 customers found that the total cost of installation would not exceed \$300. Under the old system it took three days to address the bills, whereas it can now be done in a couple of hours; so you will see the machine soon pays for itself. 

Mr. McCollum did not mention the practice of billing the residential and smaller commercial customers every second month, instead of once a month. We find it will be a great saving, and in some cases extra work would have been necessary if we had not done this; in other cases the work was not properly done. We do not expect to have any difficulty with this, and the local managers are enthusiastic about it. I would commend this to the consideration of the municipalities, and to any others who have not adopted it. By dividing the town into sections and billing the sections alternately, the work is almost cut in two. The bills under Hydro rates are so small now that the customer will not feel any hardship in paying two months' at one time.

The other things mentioned by Mr. McCollum have my most hearty approval. Practically all of them are being put into force in the Central Ontario System.

Mr. McCollum did not mention the use of post cards in billing these accounts. We purpose putting them into force in January, 1920, and we believe they will be a great saving in a considerable number of ways. I have put some of them down here in a recommendation. The post cards are the regular stamped ones provided by the Government. There is a certain saving of office space and of time in enclosing the bill in this way. Money has been saved under this scheme amounting to \$100 for bills and \$675 for envelopes. The only disadvantage we see in the post cards is the possibility of defacement in transit.

The other recommendation was to leave out the meter-reading data.

I trust what I have said may appeal to some and lead them to believe that the register has some good points as well as the cards. I am convinced that in the small offices it is the most economical way of handling the accounts.

I also think it is a good thing to show on the records the total amounts of the bills to the customers.

In conclusion, I might say that, on taking the matter up with Mr. McCollum, I brought with me a couple of pages of forms used for the Ontario Central System, and would be glad to go over any of these with the local managers interested.

Mr. P. B. Yates, Public Utilities Commission, St. Catharines:

St. Catharines is one of the typical towns, about the same size as a large

number of the larger towns and smaller cities on the System, and our smallest system is typical of that in use. We have two or three variations from Mr. McCollum's recommendations, and I am glad to say that we can vary from Mr. McCollum's practice without getting into difficulty. We do not number our consumers' record cards in accordance with Mr. McCollum's system; that is, with a number for the street and a number for the district. We have the city divided into five districts, and one man who reads the meters. He used to be our general utility man, as some of you remember, but we have rather outgrown that now, and we find he is either getting lazy or we are getting too much business for him to do. We still continue to deliver our bills, and one man will read all our meters and take care of our bills at the same time, and if he gets behind we pick up a school boy to go out and make a few deliveries for him.

There is one thing that has not been touched upon, and that is the cash register in the cashier's office. We do not have to total up all our slips. It is a very easy thing to balance in the evening. We have our slips there, and our total on the cash register, and they are divided according to their different classes or subtitles, such as "domestic light," "power," etc., so that at the end of the day it is simply a matter of taking off the main totals and the sub-totals and checking the cash with them. In the morning the cashier takes the slips from the day before and puts them in the cash book, and they have to agree with the different totals under the different headings of the day before. Then they are checked

with the slips from the cash register and written off on the consumer's ledger card, and in that way you get a check there. Everything in our office is checked as it is so well and ably done in Hamilton, but I believe our costs are much lower than in Hamilton. Our last report shows that very conclusively. This register, I believe, is quite an advantage in relieving the cashier's office of work, and also in being able to check back slips with the cash, a great many mistakes can be avoided or rectified.

We hope to put in an addressograph in the near future. We have one clerk, who makes all our bills, but we thought that with the addressograph it would lessen the amount of work as we expand.

One very good point in the paper is the idea of putting the name and address on the main bill, and the consumer's record number on the stub, so that it only takes one impression of the cash register instead of two to give you the address and numbered bill.

I am very glad to have had the privilege of listening to Mr. McCollum's paper and also the discussion thereof.

Mr. W. G. Ferguson, Hydro-Electric Power Commission, Peterboro :

I was very much interested in the paper read by Mr. McCollum. As far as the card system is concerned, I might state that I have been using the card system for over 18 years, and when Mr. McCollum came along and mooted the idea of putting a card system in the office I was naturally very much delighted.

The first impression one receives is that these cards will get lost or stolen. During the whole of the 18

years I have been using the card system not one card has been lost. We had to give up the card system for two or three years, and we were introduced to the large ledger system—the largest ledgers I ever saw. The only trouble we had was to get them written up. Of course, on account of having used the cards before that, we were very much against the using of the ledgers, but we had to do as we were told. We have been recommended to look at the banks and see the ledgers they keep. I do not think they are of very much use. Quite a number of bankers have found their way down to Kingston. Any system is open to fraud, but every convenience is found in the card system after you have become accustomed to its working.

I have much pleasure in congratulating Mr. McCollum on his very able paper.

Mr. Porter :

I would like to have an opportunity of answering Mr. Childs' remarks. It is very true he invited us or challenged us to come down and show him how to save some money. We took up his challenge and went to the expense of putting in an electrically-driven addressograph and graphotype. He gave us a very fair trial, and at the end of the trial he said, "No, you cannot save us any money." The proposition was that if we could show him where he would save any money, he would buy an addressograph. We could not show him, he says, and he did not buy an addressograph. There are possibly 20 Hydro - Electric municipalities represented here who own and operate addressographs which were

bought as long as eight years ago, and I never knew one to be thrown out, and they are buying them and using them to-day; not only the Hydro-Electric System, but other public utilities and corporations in Canada from Halifax to Vancouver. There is not a large city in Canada, with the exception of Hamilton, that does not use an addressograph, and not only the electrical companies, but the gas, telephone and water companies, and the same is true in every large city in the United States. Are those men buying those machines just for the sake of having them, or because they will save money? It is rather a reflection on those men if the addressograph does not save money. Apart from that, however, if the addressograph did not save you a dollar, is it not a good proposition to have the bills done more neatly and accurately than by the typewriter, where there is a chance for errors and omissions to creep in? I would like to have another opportunity of approaching Mr. Childs about it, and I think, if I live long enough, I will sell Mr. Childs an addressograph.

Mr. Childs :

I am sorry to have to rise twice in a discussion on this question, but really we are having so much fun (besides learning so much from Mr. Yates and Mr. Porter) that I would reiterate one statement I made. I said it depended entirely on service and cost—service first and cost second. The service must be considered first, and at a greater cost than inaccuracy. I grant Mr. Porter's contention that, if he cannot save a cent, his machine is much

better than typewriting, which is liable to mistakes, but I would say now that Mr. Porter has opened up the subject that he did all those things he said he would do, and we timed everything, and without even allowing for the time of making out the new plates and looking after them, Mr. Porter cost us money. I gave him a fair opportunity. Further than that, he asked you to compare us with other municipalities. Now, I do not wish to be compared with Mr. Yates, of St. Catharines, where he can, in that little city, read, bill and collect in five minutes. I am speaking of a city where they have some consumers and are getting more all the time. I say you must consider cost. You can get the blue book and figure out the costs of the city of Toronto per customer per annum for billing. They use an addressograph (according to Mr. Porter). You can figure out all the cities in the same way. In addition to that, you must also consider the wages paid. It has never been a desire of ours to keep our clerk down to starvation wages, and we have not a clerk in our office drawing less than \$60 a month. I visited one municipality here, in the course of the past couple of months, and talked to the gentleman in charge of the office, who had quite a number of young ladies working there, and he said "We pay them \$40 a month." You cannot compare \$40 against \$60. He may get just as much work out of some of those girls as we get out of ours for \$60, but we are not going to pay them \$40 while I know it. Service and cost must be borne in mind, and we must always bear them in mind when dealing with this question—the wages you pay your help

in the office, the cost to the consumer per annum, and the cost of the service.

Mr. McCollum :

There are just one or two points that seem to me to require another moment's discussion. In the first place, the paper that does not develop enough differences of opinion to create an argument does not justify occupying the attention of this convention for a couple of hours.

In regard to Mr. Childs' remarks, his suggestion that the accounts be numbered with a number and then a letter and then another number is not feasible if you are going to use an adding machine cash book, because the letters do not occur in the adding machine; you must use figures.

In so far as making out the bills by hand or by typewriter or by an addressograph or some other addressing machine, I have had a great deal of experience in noting the results in offices where addressographs or similar machines have been installed. I have operated them month after month, and have observed personally and have heard from the local managers the difference in the saving of their work, and I do not believe that anybody who gives it proper consideration will agree that bills can be addressed and numbered as rapidly and accurately on a typewriter as by an automatic machine that will punch them out from 10 to 40 a minute.

Mr. Hillman is here, and I would like to ask him what would happen to his organization if they decided to send their bills out from a typewriter instead of from an addressograph. I think he is in a position to answer

that question to the satisfaction of anybody who has any lingering doubts.

Mr. Hillman :

I have no statistics with me regarding cost, but I would not, under any circumstances, attempt to run a billing department of any size without an automatic addressing machine, whether it be an addressograph, a Montague or a Fisher machine. We gave the matter a thorough investigation before purchasing an addressograph, and came to the conclusion it was the best for our work. Apart from the question of cost, we consider the addressograph one of the best detecting features we have got. With the addressograph we head up our meter card, our ledger sheet, and an index card which is used for the purpose of getting the load and other information for the Inspection Department. In addition to that, we carry an alphabetically arranged file prepared by the addressograph at the same time. Very often you get letters in from your customers in which no address appears. We have to refer to the alphabetical guide, which tells us where the customer's address is.

In addition to that, we operate another set of cards, as the result of the fire we recently suffered. As you know, two years ago our offices on Yonge Street were burnt out, and we realized the danger of completely destroying our customers' records. We had fireproof vaults, which kept our cards, but they were not waterproof, and there were a good many down in the cellar where the vaults were, and the cellar was flooded up to the ceiling, and we had some job

drying everything up. We did it, however, and got a balance in a few months.

We have another card index, with all our customers recorded, in an entirely different building, and these cards go over there every day. So you see there are more uses than one to which an automatic addressing machine may be put. Personally I would not consider for a moment

running a billing department of any size without an automatic addressing machine.

In reference to Mr. Clark's point, we have the alternate monthly billing system for our residence customers. We bill one-half of the city one month and the other half the next month. It saves us about \$10,000 a year in salaries alone, and we find it works out well.

Live and Help Live

Address by Mr. Samuel A. Chase, Westinghouse Electric and Manufacturing Co., East Pittsburg, Pa.



MR. President and Gentlemen,—When I was invited by your chairman to address this meeting, I decided to tell you about my work in co-operating with Mr. Goodwin in his endeavour to harmonize the entire electrical industry. I heard Mr. Goodwin for the first time at a meeting of the National

Electrical Contractors' and Dealers' Association at New Orleans about three years ago, and, after listening to his address, I thought there was only one slogan that well fitted his work and the work I had been delegated with him to do, and that slogan was "Live and Help Live." I feel if we can only apply that slogan to all branches of the electrical industry and live up to it, satisfactory results will be achieved. At that time I gave reasons in my talk for adopting that slogan, and if you will bear with me for a moment, I will read a few extracts from the paper published at that time:



*Delegate making his
First Trip across the International
Bridge to the American Side*

In these days of reconstruction along almost all directions of human effort, it is not strange that a spirit of unrest should have found an entrance to the field occupied by the jobbers and contractor-dealers. Lawyers of the highest eminence are persuaded that both the practice of law as well as the law itself are facing changes of a radical sort. A diploma, a small black bag, and a sympathetic

bedside manner no longer constitute the essentials of a profitable medical career. Merely to know that C-A-T spells cat does not necessarily qualify one to teach the fact to others. And precisely as law, medicine or pedagogy have a future entirely different from the recent past, so also is it most reasonable to believe that the same principle applies with equal force to the more complicated business of selling the product of a factory.

Change is the fundamental fact of economic progress. To recognize and accept the probability of a change is one-half of the problem; and to see its direction accurately provides the ultimate solution.

The inexperienced manufacturer of electrical appliances creates a sales policy of selling direct, forgetting the jobber and contractor-dealer, and says they are useless. Cut them out; they are carbuncles on the commercial body; they are parasites; "they toil not, neither do they spin." Many of you have heard this sort of statement. It pretends to be an argument, and poses as a demonstration. Being both loud and misleading, it is the song of the siren in every sense so far as any useful purpose can be found. Nevertheless it has tempted many a manufacturer from the ship of safety, and one glorious summer of success has induced a multitude of disastrous financial winters.

Nearly every commercial line has been attacked by the fever, with the usual losses to the manufacturer and the injury of the distributor, and seldom to the advantage of the manufacturer.

There is an old saying that "the longest way 'round is the shortest

way home." Experimental short cuts often are costly. A multitude of greedy manufacturers have tried to sell direct at the jobber's price; a myriad of grasping retailers have tried to buy directly from the manufacturer, with the jobbers' discount. So they lock horns over this trifling middle percentage and upset the stability of trade conditions, very greatly to their own loss.

I am familiar with some of your problems; not all, not nearly all. . . But I know the confusion caused by the electric light companies when they sell electrical merchandising appliances at cost in order to increase the consumption of current. I know about the pit dug by the local contractor—into which he himself frequently falls. But, although I know something of your "hard trials and great tribulations," I know also that you should occupy an impregnable stronghold.

In the first place "possession is nine points of the law." You may say confidently, with Napoleon, "I am here. I shall stay."

Secondly, "in union there is strength," and you will impress others through consolidating associations, as a united body.

Any plan of reconstructing the method of selling electrical merchandising appliances through the co-operation and close alliance between the manufacturer, jobber, central station, and contractor-dealer, distributing through natural and legitimate channels, will place the electrical industry in a better relation to the trade than ever before.

It will make close friends of those who have sometimes been active enemies. This would be no small

accomplishment if there were nothing else; but it is only the first of a long list of benefits which will accrue, not only to the manufacturer, but also to everyone interested in the electrical industry. Why? Because the policy will give balance and stability to the commercial phase of the business. It will establish a relation which is an improvement on "live and let live," since it is based on the idea of co-operation, "Live and help live."

There are, as you know, several groups in the industry particularly interested in the subject of ethical merchandising methods—the manufacturer, the central station, the jobber and the contractor-dealer. Of course, outside of the electrical industry there are several groups also interested, but I am speaking particularly of those in the electrical industry who are interested.

There have been in the past a great many difficulties in the way of living up to the slogan of "Live and help live." I do not know the situation in Canada in that respect. You may be working together in perfect harmony, but I assume you have the same difficulties as we have. The principal difficulty in the past has been selfishness, each group in the industry thinking only of that particular group, and sometimes not thinking of the group, but thinking of each other in a simply personal way. In that respect we differ from many other industries and from professional men, who are ethical towards one another in the conduct of their profession or business.

Another difficulty has been the absence of a definite plan and of stability in prices. Sometimes I have

wondered if we were ready, in the electrical industry, for a definite plan. I rather doubted it some time ago, but in the last few months I have felt we are ready for a definite plan, and that definite plan Mr. Goodwin will submit to you this morning. One reason for my doubting in the past that we were ready for a definite plan was because I wondered if the manufacturer had the right attitude toward the contractor-dealer; I wondered if the central station had the right attitude towards the manufacturer, the jobber and the contractor-dealer; I wondered if the jobber had the right attitude towards the manufacturer, the central station and the contractor-dealer, and I wondered if the contractor-dealer had the right attitude towards the manufacturer, the central station and the jobber, and the other classes in the industry. I also wondered whether the central station was educated up to the point and possessed of sufficient experience in merchandising methods to properly regard others in the electrical industry and to realize electrical merchandise at a profit instead of at cost.

Another difficulty in the way in the past has been the misunderstandings which have arisen principally on account of the holding of closed meetings. Each group would hold a meeting by itself, and misunderstandings would inevitably arise from those meetings. This difficulty, however, has been, as the result principally of Mr. Goodwin's untiring efforts, lately removed, and now the National Contractors' Association and the National Jobbers' Association and other associations meet with open doors.

Another impediment to our progress in the past has been lack of education. No one group could understand the language of the other groups. I do not think any group, as a whole, desired to do the other groups any injustice, but it was simply because the manufacturer did not understand the problems of the jobber and the central station and the contractor-dealer, and the jobber did not understand the problems of the manufacturer, the central station and the contractor-dealer, and the central station did not understand the problems of the manufacturer, the jobber and the contractor-dealer, and the contractor-dealer (far less than all the other groups together, I am sorry to say) did not understand the problems of the manufacturer, the jobber and the central station. If it is simply a question of meeting together and discussing these problems together. There is a remedy for every difficulty in the way. It seems to be the spirit of the times to get together—not only in the electrical industry, but, as you know, nationally—and what we want in the electrical industry, as in international relations, is a universal peace, so that all classes will be able to get together and work harmoniously in accordance with the spirit of live and help live. Great progress has been made in the United States, during the last three years, as the result of the adoption of this principle in our dealings with one another. There are still difficulties in the way, but, as I have said, there is a remedy for every difficulty, which can usually be speedily found by getting together in the proper spirit and following the slogan already oft-

repeated. I can tell you of a number of cases which in the past were terrible to contemplate, but which are now carrying on under harmonious conditions, but I will not take up your time by mentioning more than two or three:

You will be surprised to learn there was a lack of harmony for a great many years at Washington, D.C. The jobbers, the contractor-dealers and central stations were all working at cross purposes. They did not hold meetings, and there was no local or national association affiliated with the industry in Washington. One evening, however, we got them all together, and, after listening to a talk given by Mr. Goodwin and a few remarks by myself, Mr. McLaughlin, general manager of the local central station, spoke a few words, and stated that not until we talked to him about merchandising, had any manufacturer, any jobber or any contractor-dealer called on him at his office in twenty-five years and told him that his selling policy was wrong. He said, "I see that our selling policy is wrong, and from now on we will play the game. We will take the contractor-dealers and the jobbers into our confidence, and before putting up a sales campaign in connection with electrical appliances we will give them 30 days' notice," and he then went so far as to say that he would help the contractor-dealers in the sale of washing machines and other appliances.

That meeting was followed up by another meeting two or three weeks afterwards, and Mr. McLaughlin was elected chairman of the little local association they had formed, a jobber was elected secretary, and a con-

tractor-dealer elected treasurer; some committees were also elected. The other day Mr. Goodwin and myself heard from Mr. McLaughlin to the effect that they were now a happy family in Washington, as contrasted with the unsatisfactory conditions which obtained when their business was conducted on unethical lines.

This work is to me very, very interesting, and I feel I am particularly fortunate in being associated with Mr. Goodwin in what I might call the closing years of my work in the electrical business. As I near the three score and ten period that is mentioned in the Bible, I feel that if I can do anything which will be of benefit to the electrical industry I will count it a privilege to do so.

I have another thought I would like to bring to your attention, and that is that we should love our competitors—make love to them as you do to a sweetheart. Make love to each class in the industry.

There is another suggestion I have to make, and that is that if there are any contractor-dealers or jobbers present who are doing anything unethical in their merchandising, let them stick to their own pastures, and not look over the fence into somebody else's pasture, where they think the grass is a little greener than in their own. Let them keep their covetous eyes trained on their own problems and work them out on ethical business lines. You, gentlemen, know what I mean by that. I do not have to state, "Don't cut prices. Don't graft customers by cut-price methods." I do not need to speak more plainly.

In conclusion (I want to give Mr. Goodwin all the time there is to spare in which to explain his method of merchandising), I want to leave with you and ask you to earnestly apply the slogan, "Live and help live."

The Goodwin Plan

Address by Mr. W. L. Goodwin, General Electric Co.,
New York.



MR. President and Gentlemen,—First of all let me tell you something about the trip that Mr. Chase and I have just completed. We started out, about two months ago, from New York and have covered practically every part of the United States, concluding our itinerary at Vancouver, B.C., where we had the pleasure of attending one of the most wonderful meetings at

which it has been my privilege to be present.

I remarked, when we took the boat from Vancouver that night (and I have repeated this statement on a number of occasions since our return to the United States), that there seemed to exist a spirit of desire for a better relationship between men and a determination to do things by the people of Canada that was not always evident over the border, and if the spirit exemplified in the meet-

ing in Vancouver can be reflected throughout Canada, I can anticipate you are going to be a very worthy competitor of the United States, not only in the electrical industry, but in every field of endeavor. I am not saying this as idle flattery. I am usually in the habit of saying what I think, and very often my statements are anything but complimentary, especially in these meetings of electrical men, where, you know and I know, we have been greatly deficient in the past.

Perhaps one reason we have been deficient (and this applies particularly to the representatives of central stations, whether they be publicly or privately owned—the principle is the same in both cases) is that we assume the attitude of an ordinary merchant, and imagine we have a product that the public will rush out and purchase simply because it is offered at a low price. That is not so. The technical nature of the product we sell, whether it be energy or merchandise, the newness of the product and the almost total ignorance thereof on the part of the purchasing public, should convince us, with a little thought and study, that no cheap, price-cutting methods will accomplish the ends we are striving to obtain. We must sell our product. If one were to make a trip throughout Canada he would perhaps find 75 to 80 per cent. of its homes unwired, and that percentage would carry even in some of our larger communities, proving conclusively that we have not sold the electrical idea to the general public. There can be no question, particularly in the province of Ontario, that you have offered the product at a

low enough price! You offered it almost without profit, and in some cases, I daresay, without profit, and still you have not persuaded anywhere near 100 per cent. of the people to use the product you are endeavoring to sell. An analysis of your rates would probably prove that much of your consumer business is taken at an absolute loss, and still the consumers have not flocked to your offices and demanded this product of energy or appliances at the low price at which they are offered. It is proved that right throughout this continent the product we have to sell must be sold by intensive methods. Aside from the fact that we have something to sell and that it should be sold at a profit, whether publicly or privately owned (as I will attempt to prove to you later on), something of a technical nature of which the public are largely ignorant, we must agree that to sell anything requires intensive methods. Then why not employ those intensive methods to our electrical industry? In other words, we must organize ourselves to present our commodity to the public in an understandable way, so that they will benefit by what we have to offer. Apart from the fact that we have something to sell, there is a greater responsibility upon the electrical industry than upon any other single industry. I contend that our industry offers a greater opportunity for the development of a country and of all humanity than that offered by any other industry. In other words, if Canada was thoroughly saturated electrically, there would come opportunity for the development of your country. Our industry will perhaps do more

to break down the great centres of population and spread it evenly over a great area than any other dozen industries combined. In the United States (and it must be so in Canada, or will be so in time) we are facing a serious situation due to the building up of these great centres of population. The attractions they offer to the public make life on the farm undesirable, and to-day you can find throughout the United States, and I daresay throughout Canada, papers literally filled with advertisements for farm help, and no response! In the evolution of things we can go back, and by an analysis of our past experiences we can anticipate the conditions which will exist a decade hence, unless something is done to spread the population of the country more evenly over the land. People flock to the centres of population because of the easy conditions of living, because of the facilities for obtaining employment, and many other inducements that are offered in the great cities. The electrical industry is the only industry which is in a position to offset those inducements, and to place the farmer in the position where he can enjoy everything enjoyed by the city dweller. By reason of the centralization of power in the large cities, factories congregate there, which has made the situation much worse, and with the exception of electrical energy, the transmission of power over large areas would be almost impossible because of the prohibitive cost of so doing. In our industry we can deliver power where it can best be used, and, in addition to delivering power, all the other conveniences that accompany it. There is no longer a

necessity of locating factories in great centres of population because of the expense of power. Power can now be supplied throughout the land just as cheaply as it can in the large centres, to a reasonable degree. Therefore the electrical industry is going to be the means of changing the whole situation throughout the land, and nothing can make the "back to the land" movement more attractive. We must spread the people back over the land, because, after all, the production in the industrial centres is not the kind of production that makes for prosperity. The farmer is the only real producer, and when we cut off the farmer, everything must cease. We are passing through an era in the United States and Canada to-day in which it is no longer possible to induce men to farm. There is too much labor required for the compensation given. The electrical industry, however, is in a position to change the whole situation. But going out to the farmer and offering him electrical energy at one cent a kilowatt means nothing to him. He does not understand relative values. He cannot conceive of kilowatts at one cent paralleling corn at \$2 per bushel. He is not interested in kilowatts per bushel, but is only interested in making a profit on the product he purchases; and the fact that foreigners are not utilizing the products we have to sell proves conclusively we have not employed the right method in selling our product. We have adopted the "bargain sale method," and have reflected that idea from the department stores, never realizing that the bargain sale method only represents about 5

per cent. of the sales of the department stores, and very often represents from 1 per cent. to 2 per cent. profit. On the train last night Mr. Chase mentioned that he fell for one of those bargain sales, only to find that the bargain sale price was enhanced by about 25 per cent. over the regular price for the rest of the month!

A little knowledge is a dangerous knowledge, and we have had too little knowledge in the electrical industry. From the standpoint of the central station, I think we have had an over-abundance of engineering knowledge and a lack of good commercial sense. As an example I might cite a man who goes to a good college and acquires an engineering knowledge and comes out of the college and goes into the central station or into the commercial field. If he goes into the commercial field, he will invariably drift into one form or another of the lighting industry. Why? Because there is something scientific or technical about it. He immediately starts to sell light on a scientific basis! Now, imagine talking to the average housewife about illumination on a scientific basis. She knows and cares nothing about it. Illumination is not the thing we want to sell to the housewife. We want to sell something which will make the housewife's work easier. We want to sell labor-saving appliances and devices, particularly in view of the scarcity of servants in these days and in view of the very reasonable doubt that in the future the servant will be with us any more. I have offered \$100 a month for a house servant, but have not been able to obtain one at any price. I

have to buy labor-saving devices, notwithstanding the fact that I have a whole warehouse stored full in San Francisco. My wife wants something to save labor. She understands lighting. You cannot sell my wife, nor any other man's wife, by saying to her, "Here is a flat iron at \$2.75," or "Here are kilowatts at $1\frac{1}{2}$ cents." She wants somebody to go up and explain the virtues of those particular appliances, and not only does she want to know the virtues of those appliances and how they are going to affect her daily work, but she particularly wants to know what kind



*The First One on the
American Side*

of an instalment basis she can purchase them upon. The product we have to sell cannot be sold for cash in any great quantities, as is proved in the sale of the washing machine and vacuum cleaner and other labor-saving devices. That has been proved in over 90 per cent. of cases in the United States. In the case of the washing machine we have had an increase in price of from \$75 to \$150, and still there has been a tre-

mendous increase in the purchase of that commodity on the part of the consumer, because we have learned to employ intensive selling methods. We are not talking price to the consumer; we are telling what the product will do rather than what it costs, and, after all, prices are relative. The public soon get to know that the Ford automobile is worth so much money, and Ford is selling as many automobiles to-day as he was three years ago; in spite of the fact that there is \$150 difference in the price; the price of the Ford is compared with the price of some other car. We proved that conclusively in California, where we had a per capita consumption of \$5. In those days we employed every conceivable cut price and vindictive business method in order to put our product over on the people, and we were able to get away with an annual per capita on appliances of about \$5. Finally somebody conceived the idea that that was not the way to sell our product, and that we should get together, organize and advertise, and put up a sufficient margin of profit to those interested to justify the selling expense. We tried that scheme for about three years, and the per capita consumption rose immediately to \$30. By proper advertising, display and solicitation, we convinced the public that we had something they wanted. You have to employ about the same methods in Canada. You have assumed that the way to put over the electrical idea was to offer your products at a low price. That is particularly true in the case of your merchandise, and also applies to the sale of energy. What does it amount to? The

energy consumed in an ordinary home, using all the appliances they may, amounts to \$3, \$4, or \$5 a month. What difference does it make whether it is \$2 or \$5? You do not stop to figure your pleasure in an automobile by the number of gallons of gasoline consumed. In other words, the automobile has been sold with the idea that it is something people want, and they will make sacrifices in order to purchase an automobile. With the proper effort we can sell the same idea to the public electrically. We can convince them that the thing we have to sell is worth so much money. Do not let us talk in technical terms of kilowatts. It is all right to talk about cost of production when you approach a man in a factory for the purpose of selling him power in large quantities. In his case you can reasonably expect that he will comprehend your meaning, but not so in the case of the consumer. We must employ the most modern, intensive methods of selling our products, and we have not done that. I dare say that three, four, five or ten times the amount of energy can be sold in Canada. What is the use of taking the public into the secrets of the electrical industry as to the relative merits of public or private ownership? And, after all, who cares? The publicly or privately owned plant can do the job, and do it right for the public. In any one community it may be public ownership and in another community it may be private ownership, but both private and public ownership will prosper depending upon the attitude of the public, and the attitude of the public is not going to be favorable simply

because we offer the product at a low price. If we get a fair price for our product, we can afford to employ the very best means of marketing it. Let us take the publicly owned central station. Bonds must be sold. The public will purchase the bonds so long as they have confidence in the property, and their confidence in the property will be measured by the ability of the men financially and in every other way. We can fool the people over a short period of time by eliminating from our accounting methods proper charges to depreciation and a lot of other things, and at the end of 15 years we can scrap the plant and go out for a new bond issue, and get a lot of money to start over again. That, however, is a temporary proposition, and, after a time, the people are going to give it up, and the financing of public ownership property on any such basis must sooner or later result in disaster. Every recognized sound method of accounting employed either in private or public ownership should be applied. You should set up your proper reserves and operate your property at a profit. If you do that, you have ample funds to take care of this tremendous field of exploitation. You cannot keep running to the public simply because you are a publicly-owned property and ask them to buy bonds to provide funds to exploit the industry in undeveloped fields. It seems to me that reserves should be set up to take care of exploitation. You cannot afford to operate a utility with a tax on the entire public, when only a part of that public participate in the thing you have to offer. It is unfair to operate a street railway at a loss

(assuming it is a publicly owned street railway), and absorb the loss in a form of taxation covering a lot of people that do not use the street railway. It is unfair to operate a lighting company at a loss and call upon the public generally to sustain that loss when only 25 per cent. or 50 per cent. of the population utilizes the electrical energy. Those who utilize a product should pay for it, and, therefore, every operating company, whether privately or publicly owned, must be self-sustaining. It is just as much to the interest of the publicly-owned plant to see that the privately-owned plant is self-sustaining and a proper rate allowed. The point I am trying to make is this, that, after all, there is no difference internally in the trade between the position of the operator of a privately-owned plant and the position of the operator of a publicly-owned plant. Their problem is the same—to serve the people. If the people desire to take over the plant, we in the electrical industry, who know values, should be willing to set up a fair price and take the property over and operate it, if that is what the people want. If they do not want it, we need not concern ourselves. I think there has been too much mud throwing in the electrical industry, particularly by politicians, who use the electrical industry and public ownership as a means of carrying an election day, and I do not think we men in the electrical industry should permit our business to be used for such a purpose. We have a greater service to render to mankind than simply to make grandstand play out of our electrical industry and use it as a political weapon. I asked the Mayor of Van-

couver why the attack on the British Columbia Street Railway Company was made; did he not admit that the rise in cost justified an increase in fares, and why was the popular political speech always in the form of an attack on the street railway company? and he said, "Why, this is the popular thing; that is what the people want." I said, "You know, and I know, that that is not what they want for their real good. In other words, through misrepresentation we make them believe that that is what they want," and he practically admitted that that was so—that it was the popular thing to do! I do not think it is good citizenship or good business for the people in the electrical industry to misrepresent the situation in that way. We should be fair to one another. That applies in the central station branch of the industry, and applies between the manufacturer, the jobber and the contractor-dealer. The greater the number of contractor-dealers you have operating in your community and conducting well-kept, high-class, retail electrical shops, the greater number of appliances will be used by the public and the greater amount of electrical energy will be used, and the greater service will be rendered to the public, and that is, therefore, your responsibility as public servants to give the public the thing they want. What they need to-day is an easier means of buying electrical appliances and a more thorough knowledge of the thing we have to sell. We have not enough high-class retail establishments—whether they be operated by the central station, the jobber, the contractor-dealer or the manufacturer is immaterial, the more

the merrier—but we must make it easier for people to buy electrical appliances. We must properly display our product and not talk in technical terms of watts consumed and load per kilowatt, because that is not what the people are interested in. The labor of a day's washing under the old method as contrasted with the new method is no basis of comparison in cost of energy consumed, and it does not matter if your rate is one cent, two cents, or three cents. The same remarks apply to cooking. If we sell the electrical appliance on the basis of convenience in cooking, we ought to be able to get more money for the thing. We are a poor lot of business men if we go out to sell an electrical cooking appliance, with all its convenience and cleanliness, and find it necessary to undersell the coal man! There is something wrong! We should try to find out what the cost is in the case of coal, wood, and other means of obtaining heat, and we should get as close to that cost as we can, but we must not try to undersell our product.

The antagonism between groups (and it has prevailed in Canada) has been due largely, as Mr. Chase has said, to ignorance of our problem. The fact that we have struggled primarily with engineering problems is responsible. Our industry has been in charge of engineers. We have had to undertake this great water power development, and the solution of all these engineering problems, and the commercial end of our business was of little consequence. That is financially proven by the condition of many of the public utilities. They show that we have not had sufficient commercial talent behind the enter-

prise. Now we are calling for a higher degree of intelligence from the commercial side of the business. We are calling for a new type of men in the electrical industry—a real commercial man that can go out and properly present our product to the public. If you analyze the articles which appear in the press (and have been in our technical papers), you will find a strain of commercialism hitherto absent. You will find that the largest percentage of space in the ordinary trade press is devoted to commercial problems. We have solved the engineering problems. We can go down to the Falls and take away 10,000 or 50,000 horse-power, as may be required, without difficulty. Our engineers understand how to do that, but the problem is to sell the product after it is produced. We need not worry about the engineering problem any more, the engineer has solved his problem, and the great problem of the future, in the electrical industry, is a commercial one. Bear in mind that in Canada, as well as in the United States, you have not reached 5 per cent. of your potential market. You have still 95 per cent. of the road to cover. Is it the road of engineering? No, it is the road of commercialism. It is a road of popularization, of intensive selling. We cannot hope to travel that 95 per cent. of the road by bargain sales or while friction between the various groups exists and unethical policies on the part of the manufacturer, the central station, the jobber and the contractor-dealer persist. An answer to your problem cannot be found by the utility man, the manufacturer, the central station, the jobber or the contractor-dealer alone, because of

the interlacing of the electrical industry. You cannot come down here and start the wheels and turn out kilowatts and have them used. Somebody must manufacture wires and appliances, and somebody must build the houses to put them in. Now, if we could carry ourselves to the ideal of some people, to a period of extreme socialism, where the government would do everything, produce the energy, run the wires and manufacture the appliances and furnish them to the public at cost, and that idea was carried out all down the line, in farming or manufacturing of every kind, and we then divided our dollars and every one was put on an equal financial basis, we would reach the millennium! But we cannot do that. We are depending upon each other. The central station is depending upon the contractor-dealer to go out and do a lot of this house-wiring, to dig up business, to sell appliances and get them on the line, because everybody won't buy from the one place. Everybody won't ride in a Ford and everybody won't ride in a Pierce-Arrow. We are selling style goods. One man wants a Westinghouse iron and another man a Hotpoint and another a Majestic heater. That puts us in competition and gives us the opportunity to go out and exploit our particular business. We must, therefore, first agree on the fundamental principles underlying the great big job that has to be accomplished, and, after we are so agreed, we should set out to accomplish it. It is not the job of the central station. Do not ever get the idea that it is. I know a little central station, municipally owned, in California, which has increased its kilowatt production about

15 per cent. in 20 years. Some progress!—not! We do not want that kind of business. We do not want a lot of old fossils running the business. They say, "If people want our product, they will come and buy it." Will they? A good live management put into that place would double or treble the business in a year's time, and offer real convenience and facilities to everybody in the community. There is no co-operation. If you want to see a "real modern electric light plant," visit the Hudson County Boulevard Plant, which is burning the old open arc type of lamp, with the old square carbons burning from the bottom, their efficiency being about 2 per cent. I said, "Why don't you scrap this stuff, and put some real live and up-to-date equipment in?" and the reply I received was, "Why, we have about 15 men to take care of in this plant. We have to trim these lamps every day and spend about \$400 a month for repair parts. If we put in a new plant, these men would be out of a job." They are producing light and giving it to the public at absolute cost. In other words, they are taxing the public exactly what it costs to operate the plant; but if the public were alive to the situation they could operate an up-to-date lighting system for perhaps one-tenth of the cost for which they are running that plant. Are you going to take any pride in an industry that plays that kind of a game with the public? No! I say it is up to us to face these new situations as they appear, and to employ the best methods we can, whether it be in illumination, whether in the distribution, or anything else. We must get together and call each other

names in language we understand. We know what the effect is all over the land, but we have not always known what was the cause. Now, the principal cause, as Mr. Chase has well pointed out, in the United States, and perhaps in Canada, was not only lack of organization, but improper organization, including the closed meeting of a lot of electrical contractors. For what? If there are any contractors here, they know what they did in the old days when they got together behind closed doors. It was a question of how much they could get for a given piece of work. I dare say, in the early meetings or in some of the early associations of municipal engineers, you know what you did when you got together. I know in the United States what they did. They conceived all kinds of schemes to put the other fellow out of business, and attempted to justify an unjustifiable position, and the manufacturers and the jobbers got together for similar purposes. That is not the right way to do business. We must have, first, proper organization, and we must have open meetings, so that each of the groups will be entirely familiar with the problems of the other groups, and thus be enabled to co-operate and assist in the solution of these problems. We must learn to employ common-sense, ethical methods. I am reminded of a little experience we had while going over on the boat from Canada. (I am surprised Mr. Chase did not tell this story, because it applies to the ethics in some lines of endeavor). When we boarded the boat at Seattle, one of the stewards carried our grips aboard, and when we arrived at Van-

couver we called one of the boys and asked him to take our grips ashore. He said, "Sorry, sir, but I did not bring your grips aboard. I will get the boy who brought them aboard." There was a chance of a double tip, but the ethics of the profession obliged him to get the fellow that carried the grips on board. Similarly, go into a restaurant, and see if you can find a waiter serving the beginning of the meal and another waiter coming along when it is about time to hand out the tip! Each man knows his place and keeps it. In the medical profession, if you are a doctor's client, and right in the middle of your case you decide to discharge that doctor and employ another one, you will find great difficulty in getting another doctor to take your case. Just try it once and see what will happen. He will want a thousand and one reasons why you should desire to change, and before he will accept your case he will go over and talk the matter out with his brother doctor whom you have discharged. Conceive of such ethics in the electrical profession, an electrical contractor having a client and serving him well and faithfully and another electrical contractor saying, "I will have to talk this over with Bill Smith before I take this job." Can you conceive of the condition where there are two central stations in a community, either privately or publicly owned—in some cases in the United States we have two privately-owned companies and sometimes one privately and one publicly owned company, and in another case two publicly-owned companies. The central station man's idea of success is to employ every means he can to

steal a customer away from the other fellow, very often knowing he is not going to give as good service as the customer is then receiving. Why, all of our engineering talent and college training is wasted when we get into business. What do we gain by it? We are not told and not paid to do it in that way, and we know as men that we should not do it in that way. Why do we do it? We are not working on a commission basis. We are not compelled to go out and perform the acts of a thief. If we get into a world war, we do not hesitate to go over and fight for a cause. We join nations together and go and fight for a principle. There was nothing definite or tangible for which we fought recently. We were not after land or money. We were willing to go out and give up our lives for an intangible thing, but in our every-day business life we are just a lot of d——in-grates, who will do anything to knock the other fellow out of business. A man said to me, "What are you getting out of this war?" I said I was not able to go across to the other side because they would not take me with my broken legs and ankles, but that my job was to stay at home, and I felt I could do a lot more at home, in my physical condition, than a lot of people could on the other side, or at least than I could on the other side, and I think this work of organizing and getting Americans, Canadians and British together and enabling them to respect each other is a d——sight more important than waiting for a lot of people to get together who are busily engaged in selfishly scrapping to secure the almighty dollar. Why not spend a little more time in studying the

causes of war or friction or contentiousness between people and nations? Let us try to remedy these troubles before we get into a row. Is any man fool enough to believe that the electrical industry could have gone on for many years building up these selfish groups, one tearing the other to pieces all the time, without something happening? Is anyone fool enough to believe that we can emerge from this war and go back to the old system of secret diplomacy behind closed doors? There must be a new order of things in the world. As Lloyd George said, only a few days ago, "We seem to have forgotten already that people have not stopped fighting; that there are some 20 wars still going on." We wonder why people wander around the country and talk about organization. Why, if we don't do it we are going to be in a worse mess than ever before. Look at the conflict between labor and capital in Canada now. Look at the conflict between labor and government. Look at what we have just gone through in the United States. I assume this group before me are real business men. Supposing I ask you what you are doing, as business men, to bridge the friction between capital and labor, what would you reply? What are you actually doing? Are you going out and meeting these people and talking to them and trying to understand their language and their problems? And if you understand them and there is any merit to their case, are you willing to sit down and talk these things over and try to find a solution, or are you going to be fool enough to set yourselves up and, exercising the power that Germany

thought she could exercise, try to put the laboring man in this country down? Is that our job? There is something labor wants, and anyone in close touch with labor knows what it is. It is not money. Anyone who believes labor is organized simply to get higher wages is absolutely wrong, and has not sensed the pulse of the working people. The working people want a new relationship and a new kind of treatment on the part of the employer. They want to sit down and talk about things which interest them. They are not concerned in the profit of the factory—that is to say, how much profit the factory makes above a reasonable profit—but what they want to know is that they are going to have permanent employment and be treated like human beings, with red blood in their bodies and families in their homes, and to receive a wage sufficiently high to meet the cost of living and permit of provision for a rainy day. Are you going to ignore these things? That is what has been done in the electrical industry, and it is the job of somebody to go over the country and bring out these facts that produce friction in industry, either between employer and employee or between group and group, or between business and government, and to get at the fundamentals which are causing the trouble and ascertain the solution thereof.

Let me outline the Goodwin Plan and enumerate the planks thereof.

"THE GOODWIN PLAN."

A campaign of education, conducted principally through trade papers, trade organizations and other channels, to co-ordinate the various interests in the electrical industry

and to bring them together in harmonious action, so that there may be established retail distribution of electrical materials at fair prices to the consumer, and at a fair profit to all parties taking part in the transaction.

The basis of the plan is:—First: That each individual owes a responsibility to the organization representing his branch of the industry.

Second: That the organization owes a similar responsibility to its members.

Third: That each organization representing each branch of the industry owes a responsibility to all other organizations in the industry, all to the end that all problems may be discussed, having in view the interest of all, thereby providing a basic plan for more adequately and efficiently serving the American public, resulting in an extension of the activities of our industry to the great undeveloped field before us.

OBJECTS OF PLAN.

Intensify development in present fields. Extend the industry to undeveloped fields. Develop greater efficiency in industry.

PROCEDURE.

First: Bring together the various interests in the larger cities, cause them to formulate a plan to extend the work to the smaller towns and cities of each state.

Second: To accomplish this, committees should be appointed from each of the four divisions of the industry, forming local committees, charged with the duty of making a study of local problems and co-operating in their solution.

Third: Individuals comprising these committees will report their

activities to their national associations, causing their national associations to take similar national action, looking to the solution of national problems.

RESULTS.

To produce harmony and develop co-operation between manufacturers, central stations, jobbers and contractor-dealers.

To produce greater efficiency in the distribution of manufactured products.

To increase per capita consumption of electricity, apparatus, devices and supplies.

Establishment of high-class stores.

Decrease in costs of conducting overlapping trade associations and saving of personal time incident thereto.

Create a more favorable public opinion.

The twenty-one planks of the Goodwin Plan are as follows:

1. A strong representative association of electrical contractor-dealers (retailers), and urges all interests to lend immediate assistance to this end.

What are the fundamental things we must do? We must organize. You have your Association of Municipal Electrical Engineers. Develop it and make it a better and stronger organization, and invite the groups in at all times to hear your discussions.

There has just been formed the Association of Manufacturers and Jobbers in Canada. Let us all put our shoulders to the wheel and help that organization along. It is a new-born babe and it is going to meet with all the troubles that infants meet with. It is going to stumble and skin its nose, and get into backyards

where it don't belong and do a lot of other fool things all new-born babes will do, all because they must get experience. You cannot tell this child anything about the experience of the father. He just wants to look over the precipice and fall down once or twice to see how it feels. So to keep this new-born babe out of trouble let us all help.

Similarly with the contractors, who have recently organized. Let us help them, too. These three organizations need development, and if the men who are operating public utilities throughout Ontario or Canada will not put their shoulders to the wheel, who will? Of course, I know you are doing everything you can, but for fear that there may be one man in the group who cannot see the justice or advisability of doing something to help these other organizations along, I say these words.

There is a real responsibility delegated to you, as technical men and commercial men, to develop this industry, and here are three new-born babes that need your help. Let us see how we are going to help them. We must build them up and tie them together. You should have in every community in Canada a good strong electrical association, with everybody in the industry meeting together and talking over local problems, and then tying these local organizations up to one Dominion-wide organization, where you can get together at some other period and talk Dominion-wide problems.

2. Each division of the industry should prepare a code of ethics outlining its own functions, relations and responsibilities to each of the other divisions of the industry.

It is a very simple matter to prepare a code of ethics. The central station man should be able to come right out and say, "Here is what we do," and spread it broadcast, so that the men in the trade will know.

5. Each division of the industry should establish a code of practice outlining its methods, policies, etc., in dealing with other than divisions within the industry.

Can you conceive of anyone in the central station coming out with a little pamphlet stating the electrical idea in simple, understandable language, so that Mrs. Housewife can appreciate it? We seem to surround the whole electrical idea with mystery. My wife received a set of bills for gas, electricity and water, and it would take the best accountant in this room to figure them out. I finally figured out I owed the lighting company eleven cents, and that they had spent 18 cents in postage stamps. I took an automobile and drove about three miles to see them and found out I owed them 9 cents. There is too much junk put on the average utility bill. You have to sit up all night to understand the thing. All the housewife is interested in is "\$2.40"; that is all she wants to know. So many kilowatts at the last reading and the next reading is of no interest to the housewife. Send her the bill for \$2.40 and don't talk about a lot of kilowatts. If you have any space on the bill put "Have you an electric iron?"

Can you conceive of a condition where the central station would put a simple little tag on its meter or in the house and tell the public, "When you buy a lamp for this house, buy

it at 115 volt" or "110 volts," and tell them why. Have we ever attempted to explain to them the analogy between water and electricity? A woman knows if she turns on the water tap so much, she gets so much water, and if she turns it on a little more, she gets a little more water. Down at Hot Springs, a little while ago, Mrs. Goodwin asked me to purchase a travelling iron, and I bought a 110-volt travelling iron in a nice case, and gave it to her and told her to connect it to the socket, and went out to play golf. I came back three hours later and found her in a nervous fit, and said, "What is the matter?" and she said, "This is 220 volts and you told me never to put 220 volts on a 110-volt circuit." A woman cannot get that stuff at all. Then, of course, if she tried to connect it in any ordinary place, she just would not get it connected at all. There are just as many kinds of base-board receptacles as there are electrical men in this room. Mrs. Brown buys an electric flat iron and takes it home and it fits right into the plug she has in the house. Next week she buys something else and goes to plug it in and she jabs and jabs and shoves, and what she says and thinks about electrical men! Talk about a lot of brainy electrical men! We are a lot of ——— jackasses. Here are a lot of college men and technical men trained in an industry, and yet they go out and sell 150 kifferent kinds of receptacles to a lot of women and children and wonder why we have not popularized the use of electrical appliances. It is all very fine for the engineer. His wife says, "I cannot connect it," and he says, "That is all right, that is a

G.E. plug," and goes down and gets another plug and fixes it up, but his wife sits there and looks on, and thinks. We must start a campaign all over the land and rip all these plugs and receptacles out of every home and put in standard plugs, just as we took out the T.H. and Westinghouse and all the other sockets and picked out one that was standard, with the result that now you can screw in a lamp anywhere. Soon we are going to scrap all these voltages and have one voltage, and some day, when the engineers get together, they will scrap these thousands of different frequencies.

In the old days we had 133 cycle and now we have 25 cycle. If we can get it down to nothing, we will have something! In the meantime, however, let us consider the power factor for the man in the power-plant, but do not let a lot of sensible engineers and business men put 25 cycle, 40 cycle, 50 cycle and 60 cycle into the home, and have Mrs. Smith, who buys a 60 cycle fan to-day, find she cannot connect it up in the house she moves into next week because the installation there is 25 cycle. It won't work! Why, of course, it won't work, we say with all the confidence and intelligence we electrical men have. We are going to take a lot of pride in the things we have done, but there are a lot of fool things we have done, and the commercial man now is commencing to make us realize it, because the great bulk of the product in the future is going to be used in the home. The load of the future is going to be, first, the load in the home, and, secondly, the industrial heating load.

Power factors are going to mean nothing in the total kilowatts consumed 25 years from to-day. I mean power factors as compared to 25 cycle or 60 cycle, etc. Our power factor will be the power factor based on the 24-hour load. Then, again, we will show some real intelligence. We will not sell on the basis of cents per kilowatt. That is no way to sell anything. We thought it was, but it is not. Bear in mind that anything that will standardize receptacles, voltages and frequencies, anything that will popularize the industry's product in the home, is the thing that is going to enable us to forge ahead. As engineers we must give up the advantage of this, that and the other if, after talking with the commercial man, he can prove to us we can sacrifice 5 per cent. in efficiency in order to get 300 per cent. more income.

4. Improvement in merchandising methods, better display, and the encouragement of more retailers, by urging present contractors to open retail stores, thereby enlisting the support of central stations and ordering a broader and larger outlet for manufacturers.

That really means no explanation. A visit to electrical shops all over the world will convince anyone of the unsuitability of the methods that have been employed. We put in a fine display of material and then sit there and wonder why people do not come in and buy it! How do you expect them to buy it after what I have mentioned to you? The product must be well displayed and clearly marked. I went into the Washington Power Company's place at Spokane on Decoration Day, where I saw fine

show cases and lots of products in them. I said to the manager, "I happen to know that is an electric egg boiler, but my wife would make 2,000 guesses and never guess what it was. Why don't you put a little sign on it and let her and other housewives into the secret?" In a window in Baltimore I found another example of the same sort of thing. A contractor down there opened a fine retail store. He remarked that it was not making the progress expected. I said, "How long have you been open?" A. "A month." Q. "What are your sales running?" A. "Twenty-eight dollars a day." Q. "What are you doing to get people in?" A. "I have a fine window display." Q. "Are you not doing anything else?" A. "No." He assumed that because he put in a fine window display and opened the door, the public were going to make a mad rush into the store and buy his product. The window display was fine. The fans in the window were all moving, and so had an interest value, but no pulling value. There was nothing about price, nothing about the fact that now is the time to take the fan while the weather is hot. There is all the difference in the world between interest and attention and pulling value to a window, and so it is with selling what you are advertising. You can run a whole page of advertising, and if you don't know how to write your ad. you won't get any replies. You won't pull. Advertising is a business. Very few contractors can write ads. We need a higher degree of intelligence in our advertising. Our merchandising methods have been bad and unmodern. If a man is going to run

an electric shop, he may be ever so efficient an electrical engineer or contractor, but he should go out and hire a man who understands merchandising. I would prefer that such a man did not know anything about kilowatts or voltages. He could be taught all he needs to know in a very short time, but you could not transform an engineer into a merchant in five years. It is a profession of itself. You know all about machines, and can tell when they are overloaded, and so on, but that does not make you a merchant. If you have not a merchandising man now, train one in your organization; send him to school and have him find out something about it.

5. Recognition of the service functions of the contractor-dealer, and recommends a differential when this service is performed.

That, of course, lies at the door of the manufacturer. We talk in terms of discount. Again, I want to say that a little knowledge is dangerous knowledge. There are very few engineers that know anything about discount, just as there are very few commercial men that know very much about engineering. I only spent four years studying engineering, and I admit I do not know anything about it. It does not appeal to me at all. I will accept the superior knowledge of the engineer on an engineering problem, but I demand that he submits to my superior knowledge on the commercial side, because I have over twenty-five years on the commercial end, and I can talk to him about the commercial end of the industry. Engineers talk about discounts. There is no such thing as discount out of the trade. A dis-

count is one thing; compensation for services rendered is something else. There is no basis you can set up (and I will debate this point with any man in the country) whereby a central station under any condition should get jobbing compensation. They do not render jobbing service, and should not get it. Discounts should be given to anyone or every one in or out of the trade, and they should be based solely on the cost of handling the product. In other words, a socket is worth so much on the manufacturer's shelf and worth so much in a case or carload. What can it matter to the manufacturer as to who buys the commodity so long as he gets the same price? That is a discount. Now we get into the trade. We have jobbers and contractor-dealers and central stations selling merchandise, rendering a service to the industry—selling, advertising, displaying, warehousing, financing, accounting, taking care of depreciation and everything that comes with the passing of the product from the manufacturer to the consumer. Jobbers, contractor-dealers and central station rendering that service are performing a part of the industry's service and should receive compensation therefor. It is altogether different from a discount. It is just as different from a discount as kilowatts are from volts. You would not have to sit up all night to tell the technical man the difference between a volt and a watt or a volt and an ampere, but the technical man does not understand the commercial side of it, the difference between discount and compensation. We must have houses wired. We must have retail stores and compensation for

services rendered. Do not confuse the two propositions, and try to tear down, by getting some price that the dealer or jobber or central station is getting in the distribution of merchandise in the form of services rendered, by going to the manufacturer and telling him you want the discount the other fellow gets; that you want compensation for services you do not render. You are powerful enough to do it and you might force the manufacturer temporarily to give it, but it is not right and is not ethical. The jobber should get compensation when he renders a jobbing service, because that is a part of the internal problem of distribution. There is just as wide a difference between compensation and discount as there is between a volt and an ampere.

6. The sale of high-grade electrical material; the establishment of high-class specialty retail shops; improved specifications in wiring installations; and the introduction of liberal use of convenience receptacles.

The tendency of the electrical people has been to cheapen the product. You are faced with that situation right throughout Canada to-day. You have an influx of Japanese-made material, the quality of which is disgraceful. If they want to come in and compete, let them live up to a high standard. We all know the quality we are selling is bad enough, even the best we can get, with all the complications of voltages and frequencies and everything else. The public have become generally suspicious of what we are selling to-day. Let us not make worse the quality of the product; let us better it. Any contractor-dealer, jobber or central

station that encourages manufacturers, and particularly foreign manufacturers, to come into this land, and will swallow the low-price product, is a menace to the community and should be treated with chloride of lime.

7. Broader education of the public concerning the problems of the electrical industry, and concerning electricity, its use and the application of household devices.

8. Retailers applying intensive sales methods in connection with small devices used in home, factory, office, etc. (such as washing machines, vacuum cleaners, dish washers, electric ranges, electric heaters, household heating devices, sewing machine motors, fans, lamps, portables, fixtures, vibrators, hair dryers, ice machines, etc.).

Let us take the public into our confidence and tell them the simple story of the electrical industry. The Sunday morning papers are just filled with stories about fine touring trips, and how to change an automobile tire and put on a patch. We are being fed that stuff, and we love it, we just eat it up! But think of taking up a paper and reading all these things about the electrical industry! Why, that would let the public in on our secrets! The automobile fellow is telling Mrs. Goodwin how to fix a spark plug, how to change a tire, and two thousand one hundred remedies for preventing punctures—just a lot of idle talk, which gets people interested in the automobile. Right now the average woman knows more about an automobile than most of us do. I could propound to the wife of any man in this room 25 technical questions in connection with auto-

mobiles and get intelligent answers in every case, but if I were to put to her one question in connection with the electrical business she could not answer—the wives of you electrical men! We should have public lectures, illustrated by lantern slides and moving pictures. Once a month a man should be delegated to lecture to the public in every community in the country. People will flock to these lectures and will subsequently flock to the industry, and have their houses wired and purchase appliances, because they will understand what they are about. We must tell them; it is our job to educate them. We get the trade papers and advertise to each other—just go around in circles all the time. We have a lot of manufacturers downstairs telling the fellows in the trade what fine things they have, and that is a good idea; but the real idea is to go out and tell the public about it. We want to advertise in the trade to keep the trade alive to what is going on. We want more public exhibits, and when we have these exhibits we don't want some fellow, with a great, big static machine, taking 200,000 volts through him and scaring the people to death. That is the kind of stuff we put in the electrical shows. We do not want to deceive the public at all—there is enough deception to the business without deliberately practising it!

9. The introduction and application of proper cost-accounting methods in wholesale and retail merchandising, particularly if either function is a minor department of a company.

That is clearly understood. The idea of that is to make each depart-

ment of a business self-sustaining, departmentalize your business. Put in proper cost-accounting methods and make each department carry itself. After you effect that, you will have real economy. Some of the central stations take great pride in that! Again a little knowledge is dangerous knowledge. If it is good accounting to divide your business into departments and get the cost of departments, why not divide the departments into commodities and get the cost of commodities? Don't tax the selling of rubber-covered wire on to the washing machines.

The Hot Springs Convention put up \$6,000 to employ auditors to go out and study the cost of commodities. Our accountants have not evinced the greatest amount of intelligence. We must have a refinement in cost-accounting methods.

10. Free and unobstructed flow of trade along most economic channels, without attempting to direct it through fixed channels.

That comes, of course, through the medium of the closed association, where jobbers and contractors, and sometimes even central station men, combine for the purpose of forcing manufacturers to submit to uneconomic policies. It is not sound, and will not last. Trade must take its natural flow. I am sorry Mr. Chase did not read a paper. In fact, I would like to have him read it at some future time. It is a paper he showed me while we were coming up on the train, entitled "The Channels of Distribution in the Electrical Industry." After you have heard it, you will be convinced that the industry is travelling at the present time in unmarked channels. We fail to

mark the channel with proper beacons and trade differentials and compensation, but we force it through arbitrary channels, and make it just as difficult as we can to get our product from the producer to the consumer.

11. That central stations conduct retail departments for the sale of lamps, appliances, devices, portables, etc., and operate same in accordance with the ethics of retailing and with full regard to proper cost accounting.

12. That all interests conduct retail departments to be operated at a profit. The adoption of this policy on part of central stations and jobbers will result in a large number of concerns entering the retail field.

That brings us back to proper cost-accounting. It means that the fact that you are in the central station or in the retail business is no reason why you should operate that business at a loss, and tax it on to somebody else's kilowatt.

13. Recognition of the service function of jobbers in the distribution of supplies, and recommends a differential when full service is performed, and a proportionate differential when only a partial service is rendered.

I have already explained the difference between compensation for services rendered in the trade and discount, and we are commencing to grasp that.

14. Jobbers determining, through proper cost accounting, the cost of warehousing and selling their principal commodities, to the end that each principal commodity will carry its proper portion of overhead.

I have just told you where the jobbers have appropriated money to determine these costs.

15. Open meetings of all trade associations, including meetings of executive committees.

I am very happy to say that principle has been adopted practically all over the country, and we have made wonderful progress through the result of this open meeting idea.

16. That the electrical press become an integral part of each division by honorary or associate membership, and that unrestricted publicity be given the proceedings of all meetings.

That has taken place. I see Dr. Carr and other representatives of the electrical press in Canada present here to-day. Publicity is what you want. Leave it to the good judgment of an editor of a technical paper to publish what will help the industry.

17. The formation of a national lecture bureau, with state and local staffs. The function of the staff would be to carry on educational work within the industry and before public gatherings. Service to be gratuitous.

18. Recognition of the principle that any action taken by a single division which affects another division is seldom satisfactory unless each division affected is represented.

That is simple. If the central station, the manufacturer, jobber or contractor-dealer are about to take action which affects another group, representatives of that group should be called in, because in these days you cannot, simply because you have the power, decide what is good for the other fellow, and force him to submit

to it. He will not do it. If you are going to take action that affects another group, call in the representative of that group and talk things over.

19. The appointment of committees by the National Electric Light Association, Electrical Supply Jobbers Association, National Association of Electrical Contractors and Dealers, and various manufacturers' associations to meet together to study the problems of the industry and to co-operate in finding their solution.

20. Consolidating or reconstructing overlapping organizations. A committee comprising representatives from each association should be formed to study this question and submit a plan.

21. Eventually a single organization in the electrical industry, consisting of national, division, state and local sections; also main national sections for the solution only of functional problems of the several branches or groups.

I expressed to your president, Mr. Couzens, and Dr. Carr my hope that before very long these problems will be indexed and catalogued and studied and answered. When that has been done, co-operation will be effective, and our organizations will be developed in every community, province and state, until there is a single organization in the States and a single organization in Canada, and eventually a single international organization, with proper sections and groups to represent every section of the country. Then we will get the best ideas together and the industry will progress.

From the standpoint of merchandising, I want to say a word about

this "Wheatstone Bridge." I like to talk about scientific merchandising. We should all understand the principles of a Wheatstone Bridge, which is the mechanical scale in our industry that enables us to determine balances. Why not apply that same principle to determine balances in commercial problems. In the place of the battery we will put the public. The public supplies the energy to the electrical industry in the form of capital, and that applies to the publicly-owned utility just as well as it does to the privately-owned utility. You are totally dependent on the public for money to keep your industry going, and to develop this great undeveloped field. Therefore, we must all enjoy the confidence of the public in order that this new capital (between \$400,000,000 and \$500,000,000 annually in the States and a proportionate amount in Canada), which is required every year to keep this industry going, may be secured. We cannot take care of new developments without profits. It requires new capital to take care of new developments. The new capital will come into the private or publicly owned plants just as long as the public have confidence in the industry; just as long as we produce proper returns on the money invested.

In merchandising, the manufacturer starts out with his finished product, and part of it goes to the central station, and it is used in the form of apparatus and equipment, and is converted into energy and gets down to the public.

Then merchandise getting to the public from the wholesaler through the retailer provides a means of con-

suming the energy produced by the central station. What does it matter if the wholesaler, central station or jobber is engaged in merchandising? There is plenty of opportunity for everyone. All we should do is bear in mind that these four groups are part of the industry, and that there is a relationship and a responsibility one to the other, and if we conduct a retail department along ethical lines, there can be no friction between the groups; we can easily determine what ethical merchandising qualities are. The easiest way in the world is to start out with a real destructive campaign on bargain prices, and the first thing you know you will have a committee waiting upon you from manufacturer, jobber and central station, and you will know right away that bridge is out of balance, and when you are all in harmony again, your galvanometer will be at zero and your industry will again progress. What is there scientific about that? Perhaps nothing. Let us look at it from another angle. I have reduced these thoughts to writing, and I will read them to let you see whether there is anything scientific about it or not:

THE WHEATSTONE BRIDGE.

The question arises as to my designation of the Wheatstone Bridge principle of merchandise as being a scientific method. By way of explanation I want to say that when we seek the underlying principle on which the scientist works, we find that the method of his work is very simple. Pure science has four main principles as its foundation—analysis, synthesis, imagination, and absolute elimination of opinion and self. It is hard to tell which of these four

is the most important, but one in particular represents the sum total of the difference between scientific and unscientific method. Too many of us have in the past accepted our conditions as a matter of course and tradition, and have not treated our problem as would the scientist. Our training has been along engineering lines, of, if commercial, we have acquired time-worn practices, not altogether in synchronism with modern business policies; hence our approach and treatment has naturally followed this early training. Meanwhile, due to faulty commercial policies, the industry has acquired many ills. If the patient would remain in its present state of health, there would be no occasion for any unusual treatment, but the fact of the matter is, we were drifting from bad to worse, and something had to be done. We have all acquired some bad habits. Individually our bad habits are not serious, either to ourselves or to the industry, but collectively they have produced ills which have reflected upon the industry as a whole, and our natural growth has been somewhat stunted. As a means of removing some of the ills of the industry, I offer this plan of merchandising. The solution of our commercial problems depends, first, upon a careful analysis of cause and effect, visualizing both and treatment by scientific methods. This for the reason that the commercial mind approaches the problem under the influence of prejudice, bias, suspicion, habit and ignorance, and allows itself to sway and stagger, and hence hesitates to action or decision for fear of momentary financial sacrifice.

The scientific mind, on the other hand, must deal with nothing but facts, admit of no prejudice, its approach is not surrounded with suspicion or bias, and it eliminates personal habit, and by a process of analysis to the smallest degree, deals with facts only, and has no personal opinion. Bear in mind that men need not be engaged in so-called scientific problems in order to apply scientific method to their every day problem. The ability to use scientific methods is, primarily, not so much a question of acquiring abilities as of eliminating disabilities. We can, therefore, make scientific inquiry by eliminating personal prejudice, bias, opinion and customary mental attitude, and admit for consideration only facts based upon actual experience which will be admitted by anyone. You will not deny that we have a complex problem in our industry in determining proper and equitable discount schedules and applying them to the various groups, especially in view of the overlapping or minor functioning. The Bridge has done much toward the establishment of group functions. But, so soon as we indulge in minor functions, we are not inclined to respect the ethics of another group, our policy is often of faulty design and trade abuses result. If, therefore, we are to engage in any minor function we should be guided by those policies, proven equitable and fair by that particular group

I claim this is a scientific method, because it has made a study and an analysis of all the facts before us. It has taken the effects produced and has gone back to the underlying

causes producing these effects, and has given us a plan which will permit us to get together. I submit it for your consideration. As I have said, it is not a hard and fast fixed rule that you must take the A B C letter of the alphabet. It is only common sense. It must be readjusted from time to time to suit varying conditions.

With the presentation of all the facts before you, it is for you to decide what is best, and then get together and work it up.

In conclusion, let me ask your pardon if I have hurt your feelings in any way, because my only idea is to get you to think, to think hard and think rightly. I thank you.



Introducing the Speaker

Discussion

Mr. O. M. Perry, Windsor Hydro-Electric System ;

Mr. Goodwin said that on the Pacific Coast the amount of electrical energy sold per capita per annum had been increased from \$5

to \$30. That, with an average of five people per family, would amount to \$150 per family per annum, or \$12.50 per month. That is so much in excess of the average domestic monthly bill of the Hydro System that I am interested in getting an average of the kilowatt hours sold per month.

Mr. Goodwin :

I said the per capita consumption of energy, and the industry's products, appliances, and so on, amounted to \$30; that is, the total of appliances and energy. The energy consumed, of course, has gone up proportionately with the general increase. The average rate on the Pacific Coast I am not in a position to give you definitely off-hand, but I would say that the residential rate amounts to about seven cents, and the average commercial rate amounts to about three cents. I have in mind four moving picture houses I have there, in connection with which I paid 2 cents a kilowatt, which I consider a very low rate. In my home I pay seven cents. It is a graduated scale, starting at eight or nine cents and running down to two and a half or three cents, and it varies in the different communities, based on the different cost of production. The Pacific Coast is largely a water-power production district, but it is a fallacious idea that energy can be produced by water power at a very much lower rate than it can be produced by modern steam plant methods. As a matter of fact, I guess some of the steam plants of this country are producing at about as low a cost as water-power plants, everything being taken into con-

sideration, so that our success on the Pacific Coast is not due to the fact that we have a low rate, because the low rate is not any lower than the average all over the country. But we should push water power development because of the conservation of natural resources rather than for the many economies involved. It is a debatable question among some of our most prominent engineers as to whether or not we can produce with water power long transmissions properly set up, and with supplementary lines to take care of emergencies, at any lower rate than we can by oil or coal. I do not believe we can in California, where we are right at the oil fields, nor where you are right at the coal fields; some of the steam plants have very low productive cost. Success on the coast is due not to the low rate of energy, but to the intensive selling methods the organization has employed in the industry in that section. The Californian campaign is a matter of print, and I shall be glad to furnish you with a copy to show how they work on a co-operative plan in that section. Mr. R. H. Ballard, President of the National Electric Light Association, only consented to accept election if the executive committee was sympathetic along sectional lines, and permitted him to develop intensive organization in each of the local sections.

It is not due to any low rate for current, but to intensive selling and advertising and publicity and the popularizing of the industry's product that the success mentioned has been achieved.

Does that answer your question?

Mr Perry :

Yes.

Mr A. T. Hicks, Hydro-Electric Power Commission, Oshawa:

I would like to ask Mr. Goodwin, with regard to advertising, whether he considers window display better than newspaper advertising. I refer, of course, to a proper, up-to-date window display, with life in it as well as appliances.

Secondly, I would like to ask him about the feature of the central station managers and superintendents having all the useful appliances in their own homes. Appliances, for example, such as the range, the washing machine, the toaster, the vacuum cleaner, and so on. I think it would be a good idea to take a census of the number of managers and superintendents present here to-day who are using such appliances.

I would also like to know whether the hardware stores have become factors in retailing electrical appliances, and as to what methods Mr. Goodwin would suggest to stimulate the sales of household appliances.

Mr. Goodwin :

Window display and advertising should go jointly in any campaign. The biggest asset a dealer has is a good location and a good window display, because the window display is the most inexpensive means of advertising he can employ. It is the most direct means. The department stores have set the best examples in that respect. They employ professional window dressers, and if there is anything delights the hearts of the ladies of the land, it is to stroll up and down the streets and look into the windows

of the great department stores. The dealer has the window at his command, and that is the best means he has of attracting the public to his store. If he can afford to supplement it with newspaper advertising, it is desirable that he should do so.

In the past the dealer has been handicapped by the fact that he had no knowledge of window-dressing, and, even if he had, he was not supplied with the proper facilities to dress his window. The manufacturer, generally speaking, has been deficient in not supplying proper window-dressing materials, but within the last couple of years the manufacturers have given a great deal of thought to that side of the question, and are to-day spending enormous sums of money to equip the dealer—and when I use the term “dealer” I include the central station also selling appliances—with proper facilities for window-dressing and display. I know two or three manufacturers who are right now working on uniform window displays, with interchangeable cards, that will be supplied to the dealers or the central stations with store, by means of which the window can be readily changed.

We must make it easier for the contractor-dealer to dress his windows. Some of the manufacturers in the States have employed professional window dressers, and they are sending them around to dress the windows of the dealer and the central station, with the idea that the dealer and central station will delegate a man to accept this training and do the window dressing himself. Window dressing is a business. It is a mistake to put a lot of dumb

animals in a window and expect the public to walk up and show a lot of enthusiasm. I would say to the ordinary dealer that the window display is the biggest asset he has.

With reference to the hardware store, it has simply filled a popular demand. The electrical man has not properly gone after the business, and the hardware man is simply filling the demand. He will always be a medium of distribution, and will also sell a percentage of electrical material, and his business will increase, but the total sales by him will decrease as we employ more intensive methods. The very nature of our product will call the public to the specialist's shop if the goods are presented in such a way that they will appeal to the public, and we can render a special kind of service that the hardware or department store cannot render. The business will flow through our channels, but the hardware store will always be a factor. He will always pick up a lot of the drifting trade that comes along and his business will increase. If he sold 15 per cent. of the product in the past, he will perhaps sell 5 per cent. in the future, but that 5 per cent. will represent a 200 or 300 per cent. increase over his present volume of business. There is nothing to fear in the competition of the department and hardware stores. They will vend the cheaper lines of product than we, and will employ bargain sale methods. They will parasite our industry as far as we permit them to do so. They will lose a dollar in the sale of the flat-iron in order to soak the consumer with \$3 or \$4 extra on a white goods sale, but I do not believe that any reputable man in the

electrical industry will tolerate his product being distributed through that type of merchant.

In the United States we are permitted to select our own customers, and I do not believe the manufacturer will select the bargain-sale type of merchant as the means of distribution. The electrical people should sell the high-grade product, and if they do so, they will acquire a reputation in the minds of the public that will secure their patronage.

About what is being done to improve the standard of wiring: I think organization is causing the contractors to appreciate their responsibility to the industry, and has done more to elevate the standard of wiring than any other thing. Recently in New York we arranged meetings between the Institute of Electrical Engineers and the American Institute of Architects, and we are now drawing up standard specifications of various types of jobs, and by elevating the standard of the specifications put out by the architect and the engineer, better work will be produced by the contractor. You could drive a horse and wagon through most of the specifications you find now. Then the fact that a lot of contractors have been writing their own specifications for architects and engineers has been a bad business. It has precipitated dishonorable methods among the contractors. The contractor who writes a specification thinks he is in an advantageous position, and puts a lot of jokers in the contractors, and the other contractor knows it.

We must have the specifications written by engineers who make it

their business to write specifications, and then we will have a great improvement along that line. With the development of the contractor into a merchant, with a store to back up his contracting business, he will be less dependent on contracting, and there will be a tendency to do time and material work rather than contracting work, and as soon as you get the contracting dealer to say, "I would not like to take a contract for wiring your house, but I will do a real good job for you on a percentage basis," he will make more profit on a good job than on a poor job. The tendency seems to be to drift away from taking the job on a contract price, except in the case of large installations, where a good character of work is generally performed.

With regard to standardizing receptacles, in the United States the question is being dealt with by five or six of the manufacturers. They had agreed on a standard, but these various devices were patented, and each fellow thought his device was the best, and, after two or three meetings, the liquor they were drinking was not right and the golf was not good and the weather was too hot, with the result that they are now fighting it out in the courts. I understand the matter is coming up for trial this week. Let us hope somebody gets licked, and that they are forced to standardize. I suppose you have the same jealousies in Canada. I think, however, that the combined strength of the electrical industry should be enough to make these fellows standardize. Put them in a room and lock the door and deprive them of water and food, and say, "You don't come out until you

standardize!" If you cannot get them together in that way, let each and every man in the electrical industry concentrate himself on one article, and then the majority of them would be obliged to give in. It is selfishness on the part of the manufacturer that is holding the whole industry back. We should be ashamed of ourselves to sell a woman a flat-iron for \$5, \$6 or \$7, with a cord and plug, a toaster with another cord and plug, and still another device with another cord and plug, and so on. I have 40 devices with a cord and plug for each one, and not one interchangeable. Why should we have to buy a cord and plug every time we buy another device? It is a fool proposition, and we are not getting anything out of it. We do not only want the means of connecting them in, but also the devices themselves standardized as to terminals, so that every device using a certain wattage up to 500 or 1,000 watts will have one kind of plug, and every other device above that some other kind of plug. I would like to see this organization pass a resolution, and then go and talk in real, understandable language to the manufacturer who will not agree to standardization.

Mr. J. E. B. Phelps, Sarnia Hydro-Electric System :

Have the Contractors' Association in the United States men they can send out into the country to give the contractor-dealers information?

In the city of Sarnia we have four or five contractor-dealers, whom I have been trying to get together to accomplish something for some time past without success. My object is

to enable them to give the public a better service in our city, but they all seem to be jealous of one another.

Mr. Goodwin :

I understand that the contractors have an organization. I think Mr. McIntyre was one of the men in that organization. I do not understand, however, that they have a man who goes around the country doing this organization work. That is indeed unfortunate. One reason why Mr. Chase and myself and others are giving up a lot of time and spending a lot of money is because we have neither the funds nor the men, and if we had the funds, we have not the men with the knowledge of this problem to do the work. It is only within the last two or three years we have released a lot of this secret and private information and commenced to develop men to go out and do this organization work.

If you cannot get the contractors in your community to see the light of day after a reasonable effort, apply a little of the draft method, like they did in the United States and Canada during the war in order to get men to do their patriotic duty. Say to them, "Now, go right on and wire your houses and see if you will get your service. I will make you worry like you are making the public worry." Perhaps these contractors cannot see the reasonableness of your talk.

I would like to hear from one of the contractors. Perhaps they have recently appointed someone to go around the country and do this class of work. To my mind, however, the expense of carrying on organization work should be borne by the whole industry.

Mr. K. A. McIntyre, Contractor, Dealers' Association :

We have neither the funds nor the time to make a regular business of educational work. At the same time, if Mr. Phelps, of Sarnia, will send a request to the Association, I will either come up myself or get somebody else to go up. Within the past week I have held meetings with the contractors in Hamilton and Kitchener, and am now in communication with Ottawa.

Mr. Goodwin mentioned specifications by contractors. There are a great many advantages in that. As you probably know, we have been forced to do it by the almost absolute ignorance on the part of the best engineers of matters pertaining to interior wiring. I do not think any of you will disagree with me on that, because very few engineers in Canada to-day have experience of inside wiring, and our Association officially stated our position at a meeting, last winter, of the Toronto section of the American Institute of Electrical Engineers. We said we would be only too glad, when there were enough engineers to standardize, to bring high-class work to industrial and domestic installation.

I would like to ask Mr. Goodwin a question which has been put in my mind by several outside of Toronto contractors: Granting that the proper policy for central stations is to specialize and to emphasize campaigns to exploit and develop new devices, does it necessarily follow that the central station, whether publicly or privately owned, should have to go into the retail business to attain that end?

In Toronto we have the Toronto Electric Light Company and the Hydro-Electric System both carrying on great stores. As far as I know, both of these systems are not cutting prices. But there is hardly a decent electrical shop in Toronto of the kind Mr. Goodwin sets up as the ideal. There is not one to my knowledge. Going out of town to the various municipalities in Ontario, where the local system has no electric shop, the contractor-dealers have shops 500 per cent. better than those in Toronto.

So I ask the question: Is it better for the central station or the contractor-dealer to open a retail store?

Mr. Goodwin:

If proper judgment is used, I think the latter. If I were running a central station and had an appliance department, I would concentrate my advertising on the specialty article. I would not waste five cents advertising a flat-iron. I would concentrate my efforts on the new goods that came out, such as an ice machine, or a dish-washing machine, or an electrically operated sewing machine—something new.

The thing is to get the public to buy from some place. There are a certain number of people in the community that prefer to deal with the independent merchant and others that prefer to deal with the Hydro. If the central station is going to run a campaign, why not have a family campaign? Why not all get into it? If we are going to put on a campaign in connection with washing machines, why not everybody get into it?

In Albany they were selling about five washing machines per week to the whole community. A campaign

was put on, and everyone of the dealers was permitted to display washing machines in the central station display room, and to send their demonstrators there to demonstrate them. They put a colored girl in the window, with an old washing tub, and right alongside of her a modern electric washing machine, and they sold 250 machines in two weeks!

Then there arises the question of instalments. All these higher-priced devices must be sold on the instalment basis, and it is the simplest thing in the world to provide a means of financing instalment sales. Many of the small dealers cannot carry the instalment business, but you cannot sell washing machines for cash in any quantity, and the same remarks apply to vacuum cleaners, dish-washing machines or sewing machines. The small dealer cannot finance the instalment sales, and in the absence of his ability to do so, the utility, the manufacturer or the jobber should do the financing. If they are unable to finance, then they should go collectively to the bank, and work out a co-operative plan of financing.

In the United States we have provided, through our modern system of banking, a means of financing instalment sales. I have a copy of the whole plan here and would be very glad to leave it with you if you are interested.

'In the city of Chicago, very recently, the groups have come together, and the Commonwealth Edison Company has offered to finance the instalment plan. I believe co-operation will produce a better result. I believe business will be set back if the utility goes out of the appliance business. I think they should con-

centrate their efforts on the new devices. The old devices, such as the iron and the toaster, will automatically sell themselves. I have learned from sad experience that in the communities where the highest degree of co-operation is developed and the central station has gone out of the retail business, the contractor-dealer got right back into the rut. The contractor-dealer needs some sort of stimulation to keep him inspired to greater effort.

Mr. McIntyre :

I did not intend to suggest that in Toronto the systems should go out of the retail business. What I intended to say was whether, in the case of communities which were already being well served by the well-run local shops in co-operation with the local System, should the local System there go into the business?

I will ask this additional question: If that System did have it under consideration, would it not be best to consult the local contractor-dealers before taking any such step?

Mr. Goodwin :

I would say that would evidence a spirit of co-operation, but I would have to be shown the community in which any contractor-dealer was properly cultivating all the business, and developing an intensive market. There is no such thing as saturation. They have not yet reached saturation in the case of the old foot-power sewing machine. We cannot think of saturation. I would say that if I were running a central station even where the contractor-dealers were rendering good service, I would go into the appliance business, and

would co-operate in such a way with the contractor-dealer that we would be better friends every day. I do not think the contractor-dealer is enough of a merchant to appreciate the importance of this job, nor the financial ability or experience to carry the job along, and, I believe, if the central station goes in and co-operates, the business will increase.

Mr. McIntyre :

Is it not true that in Albany the central station does not sell, but displays and advertises in co-operation with the dealers, and induces the dealers to display their goods in the showrooms of the central station. Would not that possibly be a better plan?

Mr. Goodwin :

There are two communities—Albany and Louisville—where the central stations permit the dealers to advertise their wares at market figures, and they sell the wares for the dealers and charge 10 per cent.

The same method is employed by the New York Edison Company, and it maintains the best show-rooms outside of the Commonwealth Edison Company of Chicago. The inquiring purchaser is referred to the dealer. They have had the field for 20 years in New York. The New York Edison Company is the greatest co-operator I know of, but New York is about the lowest point of saturation in the country, and I have urged Mr. Williams to go into the business. I think the moment he starts to sell appliances you will find first-class electrical shops springing up all over New York. The rottenest electrical shops in the United States are in New

York, where the co-operation is 100 per cent. with the central station, but there is such a thing as making the path of life too easy for the average American or Canadian, and a few rocks in that path causes them to keep their eyes on the steering wheel.

Mr. McIntyre :

I will just take up Mr. Goodwin's answer to my question by saying my partner made a special trip to New York to see what was done there, and visited the New York Edison Company's place and said it was wonderful. He also said he was referred to what was supposed to be the best shop in New York, and went there, and came away saying that in New York the dealers were fast asleep.

Mr. C. Meyrick, Hydro-Electric Power Commission :

I would like to ask Mr. Goodwin to draw a distinction, if he can, in regard to compensation in connection with jobbers and central stations. I do not know whether Mr. Goodwin is aware of our situation here, but I would like to ask him if that remark refers to the Hydro or utility store or municipal store. The Hydro-Electric Power Commission of Ontario, at the conclusion of last January's Convention (the last time we had the pleasure of hearing Mr. Goodwin speak, and the substance of which speech we feel we have absorbed and made every effort possible to put into effect all throughout the System), carried out every detail of the work that was possible. In that connection we have incurred considerable expense. We have got the manufacturers, the energetic

manufacturers, to come out and co-operate with us in the great work of revolutionizing the question of sales in Ontario, and where it has been necessary to open a new store we have invited the local representatives of the manufacturer to join us. Such work, we feel, is worthy of some compensation. Therefore, I ask Mr. Goodwin is not some compensation due to the Hydro Power Commission in the capacity of an exploiter and in jobbing or re-selling a commodity?



Mr. Goodwin :

I would say yes. You have raised a question which is fundamental, and if not properly handled, will lead to a very serious situation. I take it that at least some of the manufacturers are not granting to the Hydro what you consider fair compensation for the services you render. Now, it all depends upon the approach you make to that particular manufacturer. We must be absolutely fair and broad-minded in this whole proposition. There exists to every electrical manufacturer in Canada a

real menace in the Hydro if you exercise to the extreme your power to purchase. What I mean is this: If I were an electrical manufacturer in Canada I would hesitate to put myself in the position of marketing my commodities through the Hydro, because of the tendency to make me dependent on you as my sole outlet. In other words, if the Hydro System develops along the line that each of these respective communities purchase their own requirements and their own particular style and designs independent of any other plant, I think the manufacturer will willingly and gladly give you proper compensation for services rendered, but if the tendency on the part of the Hydro System is to develop concentrative buying through a central force and use its purchasing power to squeeze the manufacturer down to minimum prices for his product and compel him to use the Hydro as an outlet, I would fight you. Let us take the question of meters. Supposing someone gets up in a meeting like this and says we should go to one manufacturer and give him all our meter business based on the total consumption of all these various plants. You would say that is a good idea, and we will do it. That, however, means that one manufacturer is going to get the business. Let us carry the idea to the extreme. Let us bring all the plants in Canada together and apply the same principle, apply the combined purchasing of all the plants to a single meter. You have one manufacturer of meters and you are going to drive everybody else out of the business. Temporarily it is a fine thing for you, but God help you when that manufacturer

drives everybody else out of business!

Let us take another situation. I do not know how many meter manufacturers you have in Canada. Combine your purchasing power and concentrate on one manufacturer. In Ontario your demand is unusual, and the manufacturer must provide facilities in order to take care of this one very desirable purchaser (very desirable while the going is good), but at the end of the year somebody in this room gets a grouch, and says, "I prefer the Westinghouse. I like the aluminum cases," and so on, and say, "We will divide this up and give it next year to the Westinghouse or the Canadian General Electric," then what is the fellow who has put a lot of money into this meter business going to do? He has a factory and a lot of men and a lot of capital tied up, and he will close the whole plant out, and the other fellow is going to build a new factory and steal the men that the other manufacturer trained up. What would you do? The manufacturer would be a fool who would put money into that scheme, with the uncertainty that is bound to come through concentrated purchasing power. You must never get the manufacturer in the position where you become a menace, because he is going to fight you.

A voice :

What about concentrated selling power?

Mr. Goodwin :

Just as bad as concentrated manufacturing if you put it on your product. The greatest development will come with the greatest diversity of

manufacturing institutions. The greatest development in the electrical business will come with the great diversity of manufacturers, but if you put all your manufacturing into the hands of one man, he will become lazy. I can sense what the manufacturers in Canada and the United States fear. I think it is bad to concentrate the manufacturing to one single unit, so that you are dependent on a single company. I think it is bad for a manufacturer to be dependent on a single purchaser. There is a real menace to you as well as to the manufacturer, to the people of Canada as well as the men in the industry, if you concentrate your purchasing power. I think it would be a very unwise thing for the Hydro Commission to attempt to constitute itself a distributing medium to all your plants. You cannot have co-operation if that is your scheme.

Mr. Meyrick :

I think that applies equally to every manufacturer in the electrical industry. I further take it that the question of compensation regarding the utility store or the Hydro Power Commission as a whole is one directly for the Hydro Power Commission to deal with. In that connection I will ask who is going to further the idea of a "Goodwin Plan" in the Province of Ontario, where we, as energetic electrical men, are desirous of having applied, if not the Hydro?

Mr. McIntyre made remarks, a moment ago, about not having a man permanently employed to go out and organize the contractor-dealers. May I state that we have in many cases assisted you, and I think I can find sufficient support in the room to con-

firm that. Mr. Phelps offered his services to organize the contractor-dealers.

If I am wrong in interpreting the Goodwin Plan at this late date, I would be very glad to have it explained now, because we are very desirous of working along ethical lines rather than antagonistic lines. It is a new plan and we are open for education. If we are wrong, we want to be set right.

Mr. Goodwin

I do not understand that you have a wrong interpretation, and I do not know that I have said anything that differs from what I have said before.

In answer to your question about compensation for services rendered, I say you should get that. I attempted to picture what I thought was the reason why you had not received it. That is a question that perhaps has nothing to do with my plan. It is a question of an individual manufacturer trying to preserve himself, and I can see why a manufacturer would hesitate to give compensation to the Hydro or anybody else if he thought that compensation meant his own destruction.

The Goodwin plan does not contemplate the idea that any man is going to submit to a proposition that means his own destruction. At the same time I attempted to point out what I thought would be a menace to your business if you attempted to employ any such methods of concentrated purchasing. Let us assume that the Hydro elected to go into the jobbing business. There is nothing in my plan that would prevent them doing so, but they would not and

could not go in and develop an equal kind of competition with other jobbers. The other jobbers would have to go out and sell their wares on the basis of services rendered. They would have to present real good selling arguments in order to convince you or a contractor-dealer to buy his wares. But if the Hydro went into concentrated purchasing for the purpose of obtaining a low price, it would result in the contractor-dealer sitting back and acquiring the habit of laziness. We lose sight of the fact that the success of a business is not made by the price we purchase a commodity at. There is no money made in the purchase of anything, and you men, in the operation of your plants, will not make money by purchasing in quantities at low prices. You make money when you sell an article, whether it be real estate or merchandise or electrical energy. The way you purchase very often determines the type of market you are going to sell. A week ago you could buy stocks and bonds at one hundred and forty, and two days ago at one hundred and twenty, but who wants to buy stocks or bonds on a declining market because they are cheap? Every business, properly run, works on the law of percentages, a certain percentage for overhead is added to the commodity, and the percentage of profit made on a dollar is more than the profit on eighty cents so long as you can sell satisfactorily to the public. There will be no success in your Hydro Development in your concentrated purchasing power. The little you might save through enjoying a quantity discount will not help you, because I have attempted to point

out that the big job is to sell the idea to the public, and price does not enter into it. The Hydro wants security, but the healthy development of Canada demands that you give security to the electrical manufacturers, too, because, if you kill them off, and become dependent on the United States and England for your product, you will see the manufacturers in those countries soak it into you.

Mr. Meyrick :

Compensation for services rendered, as I understand it in regard to jobbers, is a standardized principle among manufacturers. This exploitation work which Mr. Goodwin mentioned in January last is very expensive in regard to ice machines, dish-washing machines, and other little-known appliances.

Mr. Goodwin :

I would like to ask Mr. Goodwin to make a statement as to the distinction he would draw between allowing compensation to the Hydro for services rendered and anybody else?

I have said I cannot see any distinction between allowing compensation to the Hydro and anybody else for services rendered. There is no argument there at all. It is absolutely sound, sensible business. The only reason that would prevent it is the one I attempted to point out, where a manufacturer sees ahead of him a menace. Self-preservation is still the first law of human nature, and compensation disappears when a menace appears. You would have to be more specific and cite the manu-

facturer and the particular commodity, and the rate of compensation.

Let us take a specific case in the United States. Some of the contractors say that the compensation allowed by the manufacturer on the sale of motors is insufficient to cover the cost of handling and selling them, and the manufacturers say the cost is excessive. I say to the contractor, "You make a contention. Where are your costs?" The contractor says, "I do not know, but my judgment dictates that I am losing money on the sale of motors." In other words, he knows nothing about it.

The motor business in the United States amounts to possibly \$35,000,000 a year, and the contractors ask \$3,500,000. Ten per cent. I would ask anybody for that myself. I would not be a fool in asking for it, but you would be a fool in giving it to me!

The manufacturer, on the other hand, says the compensation is sufficient, and I say to him, "Let me see your figures to prove it is sufficient," and the manufacturer does not know, and there we are with locked horns. We have to get statistics to prove the case.

A man in Cleveland, named Oppenheim, was interviewed, and said, "You are preaching compensation. Before you do so, why don't you tell the General Electric to give us decent compensation, so that we can live?" I said, "I don't know why the General Electric do not give you decent compensation, but, as I recall your sign over your door, it reads, 'Oppenheim, the Price-cutter,' and

you are the worst price-cutter in Cleveland, and I take it the manufacturer has been giving you too much compensation." We get back to the proposition: What is the right basis of compensation? The best way to measure it is to feed it to the dealer, jobber and Hydro in small doses, and immediately he starts to cut the price withhold it. You jobbers and manufacturers in Canada are the worst lot of price-cutters I ever saw. You must be getting too much compensation or you would not be giving it away. You are getting compensation from the manufacturer for rendering a service, and instead of keeping it as your profit, you give it away. The answer must be that the manufacturers are giving you too much. The compensation should never be any more than a man will keep. Perhaps the Hydro have given it away. I don't know. If you will tell me the specific case, I will endeavor to give you a better answer, but, while we are talking in generalities, that is the best I can say.

Mr. H. F. Shearer, Hydro-Electric System, Smith's Falls :

I think the conditions suggested by Mr. Goodwin and the remedy therefor lies with the individual local sales manager. He is not compelled to buy from the Hydro-Electric Power Commission, and if they suggested we stock up with one line of goods the province over, I think we would be very foolish, because I think the most of us will agree that where we have a varied stock, we will in a good many cases make a sale that would have been lost if we had only one line of the same article. I mean if we were

stocked up with Hotpoint irons and no other irons, there would be a good many cases where we would not sell an iron because we did not carry a cheaper iron. It lies with each individual sales manager to stipulate the stock he will carry, and in that way we can vary the stock.

I would like to ask Mr. Goodwin, in regard to the instalment plan, how he would protect either the jobber or the central station against being fleeced by spurious customers in the case of house-wiring. Where there is an appliance, we can protect ourselves through a lien, but I do not

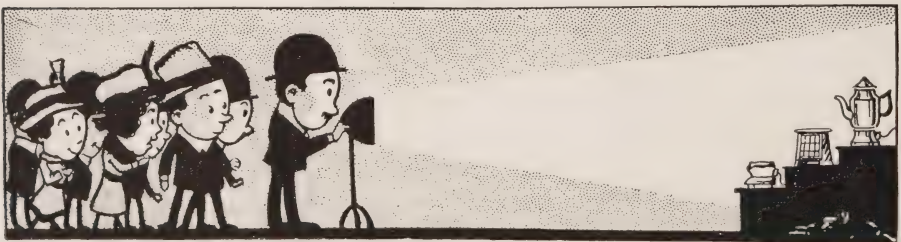
entirely paid for and the party left the country or refused to complete the payments. It seems to me the house-wiring proposition should be a cash one.

Mr. Goodwin :

Of the choice between the selling of appliances on instalments and house-wire on instalments, so far as security is concerned, I will take the house-wiring. We know from experience of over 20 years, in every line of endeavor, that the credit losses on instalment sales are less than 1 per cent. As a matter of fact, they average one-quarter of one per cent. in the case of all the big instalment houses throughout the United States. You are selling to what might be regarded as the most unreliable kind of purchaser, the one that has to buy on the instalment plan, but there is something about the people of this continent that makes them keep their instalment payments as faithfully as they will keep their religion. If you give a man a washing-machine on sixty days' credit, he will beat you right and left, and if you sell it on the instalment plan you will have to chase him all over the country. In the case of house-wiring, however, he cannot move it away, and it becomes a lien on the building all the time.



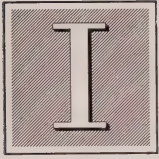
think we would stand much of a chance of attempting to remove the wiring from a house if it was not



Overhead Distribution Systems

By C. E. Schwenger

Engineer of Distribution, Toronto Hydro-Electric System



IN this paper attention will be called to some of the more important details entering into the design and operation of overhead alternating current distribution systems touching upon certain points with a view to bringing about a discussion which may result in arriving at conclusions of mutual benefit.

These will be brought forward under the following general headings:

- (a). Secondary Lines.
- (b). Transformers.
- (c). Primary Lines.

SECONDARY LINES

Under secondary lines will be included all lines intended to supply service direct to apparatus on consumers' premises at voltage of 600 or less. Such apparatus includes motors, lighting and heating equipment.

For the purpose of this paper we shall consider particularly the supplying of lighting and heating appliance loads, as these loads require closer voltage regulation than motor loads.

In the matter of supplying lighting and household appliance loads, statistics show that a greater demand exists for 115 volt equipment, especially lamps, than for other ratings. Now if the supply at the socket

is to be at 115 volts our secondary lines must operate at a somewhat higher voltage depending upon the amount of voltage drop which we shall allow. For this purpose let us allow 2% drop in secondary lines and 2% drop in consumer's wiring. We shall then find it necessary to maintain a voltage of approximately 120 volts during periods of greatest load on our secondaries.

For our secondary system we have the choice of

120 volt 2 wire single phase.

120/240 volt 3 wire single phase, and
Various combinations of polyphase connection.

The polyphase combinations are not generally used and will be omitted from this discussion.

For equal conditions as to load, voltage drop, and losses, the relative copper requirements by simple calculation, assuming 2 wire single phase line as 100% is as follows:—

120 volt single phase, 2 wire—100%.

120/240 V. single phase, 3 wire—
37.5% (neutral equal to each outer.)

120/240 V. single phase, 3 wire—
31.25% (neutral equal to one-half each outer.)

This shows decided economy in use of 3 wire system. having neutral wire one-half the size of each outer.

The problem of secondary lines usually resolves itself into one of two classes:—

- (1).—Lines with supply at one end and the load concentrated at the other.
- (2).—Lines with supply at one end and the load distributed from one end to the other.

The first problem lends itself to easy calculation as the factors entering same are well known. This problem in City distribution is not often encountered. However, in City distribution or in thickly settled communities the load is generally of the distributed type. These secondary lines are often tied together at each end and supplied from a common bus forming a network.

For the solution of this problem, in which we shall assume the load as evenly distributed, we must know the total load distributed over the line, and also the distance of furthest consumer from the bus or transformer. Having chosen the allowable drop between bus and furthest consumer, say at 2%, we then have an allowable drop 2.4 volts, total load say 20 amps at 240 volts and distance say 750 feet. It is well known that for evenly distributed load

$$E = I \frac{R}{2} \text{ or } R = \frac{2E}{I}$$

Where E = Allowable drop

I = Total load current

R = Total circuit resistance.

$$R = \frac{2 \times 2.4}{20} = \frac{4.8}{20} = .24 \text{ Ohms}$$

i. e. 1500 feet of wire = 24 ohms.

1000 feet of wire = 16 ohms, which corresponds to No. 2 wire.

Using this method convenient tables can be calculated.

In the matter of voltage regulation it is clear that due to line drop the lamps near the bus are operating at 2% higher voltage than those at

the other end. If voltage regulators maintain constant voltage on lamps at the bus then lamps at other end operate on voltage varying 2% between full load and no load. This is also true for lamps at the bus end if constant voltage is maintained at the lamps at distant end. In the former case the distant lamps at the loaded period operate at a voltage 2% below normal and in the latter the lamps near bus operate at a voltage 2% above normal. However, if the regulators are adjusted to maintain constant voltage at lamps at a point between the bus and the distant end so that on peak the rise in voltage of lamps at the bus equals the drop in voltage of lamps at distant end, then we shall find that with 2% difference in voltage between lamps at each end that the lamps at either end operate on voltage varying but 1% from normal but in opposite directions. The point at which we should regulate to obtain this result is approximately one-third the distance from bus to other end.

Now if we are to allow a voltage change on the lamps on account of secondary drop of 2% it is evident that by using regulators adjusted for the one-third point we can use secondary conductors having twice the resistance found necessary for lines having constant voltage conditions at either end. Thus in the problem above we may use wire of .32 ohms per thousand feet. The nearest size corresponding to this is No. 5 wire, which has approximately one-half the weight of the No. 2 wire.

This gives an indication of the economy in secondary conductors

made possible by the use of regulating equipment on our supply lines.

TRANSFORMERS

It is apparent that with a secondary system, such as just described it will be necessary at period of maximum load to maintain approximately 120 volts at the transformer. Therefore, if transformers are to have the standard ratio of 20 to 1 they should have a normal primary rating of 2400 volts.

Transformers should be provided with several percentage taps on the primary winding. The reason for this will be discussed under primary lines.

Transformers should be operated to carry at least full load during period of maximum load. This is necessary from a standpoint of efficiency and economy, for which no idle transformer capacity should be installed on the lines. For this unused capacity we are getting no revenue return with which to pay for the extra losses and capital investment charges such as interest, depreciation, etc. In addition to this there is capital tied up which might be put to more efficient use.

For the purpose of keeping the transformers loaded efficiently it is desirable that records and tests of maximum loadings be kept. This would enable us to see that no idle transformer capacity is installed, and also to avoid loading transformers to the danger point. In the case of transformers supplying power loads this is a comparatively simple matter as the number of consumers supplied from any one bank is small and connected load

records are easily obtained. On account of heavy starting currents required on motors it is usually not advisable to carry in connected load more than about 150% of the rating of each power bank. This applies particularly to power banks rated under 75 K. V. A. This is a rough rule. It is safer to check each bank by taking current readings at the maximum loaded periods thus obtaining direct information.

However, in the case of supply for lighting and heating appliances where transformers are operated in banks supplying a common bus and distributing network it becomes practically impossible to keep a useful up-to-date record of connected loads on account of the constantly changing large number of consumers, and of the varying load conditions of individual consumers. In this case a good check can be obtained by taking current readings on the transformers during the hours of maximum load. The writer finds that these readings should be taken about once per month during the winter months. The load in summer months is comparatively light, and, therefore, readings are not required. These readings are conveniently taken by using a so called "line testing set" consisting of split core current transformer and ammeter. This gives us directly the actual load demands on each transformer. The maximum load which any transformer may carry depends upon the temperature at which the transformer operates. Transformers are usually designed by the makers to operate at full load continuously without exceeding 50 degrees C.

rise in temperature when the surrounding temperature is 40 degrees C. This gives us the maximum temperature as 90 degrees C.

Transformers on house lighting service operate at their maximum loads during the winter months when temperatures are low, usually below 0 degrees C. and also during the evening when the temperature is usually somewhat lower than in the daytime. In addition to this they carry their maximum load not more than four or five hours, and for the balance of the day the load is very light. From this it can be seen that in order to reach the high temperature for which they are designed transformers must operate at considerably more than full load during the hours of maximum load in the winter months. Under conditions of service such as this they can safely carry 50% overload without damage. Also during the long period when they carry little load they obtain an opportunity to cool down again to a comparatively low temperature.

In addition to information as to loading of the transformers these readings tell us how closely the loading is balanced on either side of the neutral. If the load is found to be unbalanced steps can easily be taken to reconnect service to bring about a balance. Connected load or consumers' demand records do not give us information on this point. Where such records are relied upon there is a possibility of producing a heavy overload on one-half the transformer when connected for three wire oper-

ation and still not have a heavy total load on the transformer. There is, therefore, danger of burning out the transformer. Also if trouble develops on one side of the secondary system in the form of a short circuit well out from the transformer sufficient primary current may not flow to blow the primary fuse again producing a danger of a burn out.

When transformers supply three wire secondaries it is desirable to operate them connected for 120 volts, two in series across the outers. When so connected should the transformers on one side of the neutral blow their fuses due to any cause, only one-half of the transformer bank becomes inoperative as the other transformers will continue to supply service. Thus where two wire services are supplied but one-half the consumers are without light. When three wire services are supplied and these are becoming general particularly for store lighting, it follows that but one-half of each consumers' lights are out of commission, which is much less inconvenient than to have all lights out. The secondaries of transformers operating at 120 volts 3 wire must be grounded at the neutral point if three wire, and two wire one side must be grounded. For the purpose of grounding driven pipes at the side of the poles have formerly been largely used but these are found to be often of little use and are not recommended. Solid grounds should be installed. These are best obtained by connection to water mains or pipes, and if these are not available copper plates buried

in coke should be used. These should be placed deep enough to lie in earth permanently moist.

All transformers should be protected by lightning arresters, placed on the same pole as the transformers. However, it is well to run a separate ground wire to the ground plate independent of the neutral grounding wire.

PRIMARY LINE

(c) Under primary lines will be included all lines intended to supply transformers having primary windings nominally rated at 2400 volts. As to choice of such lines we have the following:—

- (1).—Single phase, 2 wire, 2400 volt.
- (2).—Three phase, 3 wire, 2400 volt (delta connected.)
- (3).—Three phase, 3 wire, 2400 volt (star connected.)
- (4).—Three phase, four wire, 2400 volt (star connected.)

There is also the two phase 2400 volt system having either 3, 4 or 5 wires, but on account of this being now more or less obsolete it shall be omitted from this discussion.

Now let us take up the question from standpoint of copper requirements. Easy calculations show that for equal conditions as to load, voltage drop and losses, and assuming the copper required for the single phase 2 wire lines as 100%, the following obtains: (see table 1).

This clearly shows advantages in

the choice of one of the 2400 volt Star connected systems.

Again let us decide as to nature of secondary service to be supplied. It is desirable to supply mixed lighting and power loads from the same primary lines to avoid duplication of feeder equipment and lines, more so if the power loads are moderate and do not overlap the lighting loads to any great extent. This condition allows the feeder regulating equipment to care exclusively for lighting loads when operating at maximum load, without interference from power load surges so detrimental to good regulation. Where considerable power load only has to be taken care of unregulated three phase feeders should be run as motor loads do not require closely regulated service. A choice of feeder supplying exclusive power or mixed loads will, therefore, eliminate the choice of the single phase feeder leaving us the three phase systems.

Where three phase power loads are to be supplied it is often desirable to connect two transformers in open delta on secondary side, thus making it possible at any time to close the delta with a third transformer should a larger power demand occur. The reverse, of course, is desirable also and it should be possible to continue service if one transformer (where three are used) becomes defective. This condition can be handled by

Table 1—System	
2 wire single phase 2400 V.	100%
3 wire three phase, 2400 V. (delta)	75%
3 wire three phase, 2400 V. (star)	25%
4 wire three phase, 2400 V. (star)	20.16% (neutral wire one-half outer)
4 wire three phase, 2400 V. (star)	33.33% (neutral wire same as outer)

Copper Required
100%
75%
25%
20.16% (neutral wire one-half outer)
33.33% (neutral wire same as outer)

the three wire three phase delta system and by the four wire three phase star system. This cannot, however, be supplied from the three wire star connected system.

Referring to the matter of regulating equipment required for lighting loads the three phase 4 wire system has decided advantages. With a single phase regulator on each phase wire this can be adjusted to act independently without interference through load condition on the other phases. The regulator action is quite stable and compares in this respect to the single phase feeder and regulator. This is not the case in regulating delta connected feeders where unbalancing of loads on the various phases cannot be so nicely taken care of. Changes of this kind usually effect all phases. Another feature which is in favor of the 4 wire star connected system is the fact that on account of the higher voltage between phase wires it is possible to transmit with equal sized conductors and with equal voltage drop any given load approximately three times the distance possible in the delta system. This is desirable where loads in suburban districts have to be handled.

The above considerations would lead us to the adoption of 4 wire star connected system.

Where a heavy secondary network is to be supplied the neutral wire of this can be used as a common neutral for the primary lines as well, thus saving an additional wire and giving us the economy in copper of the 2400 volt 3 wire star connected system.

As in the case of secondary lines the problem resolves itself into the two general classes:

- (1).—Lines with load concentrated at the end.
- (2).—Lines with load distributed from one end to the other.

The distributed form of load is more commonly encountered, and for the purpose of this discussion we will assume that the load is evenly distributed.

For the supply of such loads we have two general schemes of primary layout, namely the straightaway feeder with small branches and the centre of distribution or "feeder and main" system.

In the straightaway feeder loads are taken off along the line while in the feeder and main type the feeder is run to a centre of distribution at the centre of the load and mains are run in all directions from this centre. No loads are taken off the feeder between the station and the centre of distribution but are all taken off the mains.

Let us assume a case of feeder of length "L" with load evenly distributed along its whole length. The total load in amperes = I. Consider but one wire of length "L" having resistance R.

Then for evenly distributed load the drop $E = \frac{R}{2}$ or $R = 2E/I$ (1.)

Now compare this with a feeder and main where the feeder is run to a point $\frac{1}{2}L$ from the station and two mains are run one back to the station and one to distant end L. Suppose we wish to use same amount of copper as in straightaway line we then have feeder of resistance

$=\frac{R}{2}$ and two mains together of length "L" whose weight is the same as feeder whose length is $\frac{1}{2}$ and resistance $\frac{R}{2}$

Now weight of conductor = Constant $\times \frac{\text{LENGTH}^2}{\text{RESISTANCE}}$

Then weight of straightaway conductor = Constant $\times L^2/R$ and weight of Feeder in "Feeder Main" = $\frac{1}{2}$ this or $\frac{L^2}{2R} \times \text{Constant}$

The mains are of length "L" and of same weight as the feeder portion or = Constant $\times \frac{L^2}{2R}$

Therefore the mains of length "L" have resistance "2 R" or each main of length L/2 has resistance "R". Now drop in straightaway feeder = $\frac{IR}{2}$ (shown above) (1).

For feeder and main system we have

Drop in feeder portion = $IR/2$ i.e. drop in feeder of resistance $\frac{R}{2}$ with load I concentrated at one end.

Drop in main $\frac{1}{2} \times \frac{R}{2}$ since this is distributed Load of current = $\frac{1}{2} I$ and resistance R.

Therefore Total drop = $\frac{IR}{2} + \frac{IR}{4} = \frac{3IR}{4}$

Thus we see that for straightaway feeder we have less drop to most distant transformer than in the

feeder and mains system for equal costs as to copper used. Therefore, this system should be used where constant voltage is being maintained at the station and feeder voltage regulating devices are not used.

Now let us consider the use of feeder voltage regulators.

In the "Straightaway" feeder there is a total drop of $\frac{IR}{2}$ and if we regulate for the $1/3$ point as discussed under secondary lines we have a variation of voltage due to line drop of $\frac{IR}{4}$ delivered to transformers at either end of the feeder.

Now in the case of feeder and main system above discussed, if we regulate for the $1/3$ point between centre of distribution and the end of the mains we have a variation of only $\frac{IR}{8}$ since total drop in the main is $\frac{IR}{4}$.

Thus we have only one-half the variation between transformer although we have more total line drop.

If we assume $\frac{IR}{2} = 4\%$ or 96 volts on 2400 volt line we can tabulate for easy reference the following:

Full Load Conditions.

	Single Feeder	Feeder & Mains.
Total Primary line drop Station to most distant transformer.	$(\frac{IR}{2}) - 96$ Volts	$\frac{IR}{2} + \frac{IR}{4} - 144$ Volts
Line drop to nearest transformer.	— 0 Volts	$\frac{IR}{2} - 96$ Volts
Difference in voltage between nearest and furthest transformer.	$\frac{IR}{2} - 96$ Volts	$\frac{IR}{4} - 48$ Volts
If regulating equipment takes care of one-half this drop maximum difference of voltage applied to transformers	$\frac{IR}{4} - 48$ Volts	$\frac{IR}{8} - 24$ Volts

It is clear that when feeder regulators are used compensating for line drop that closer regulation can be obtained on feeder and main system.

Now take the case of a feeder which is supplied with constant voltage at the station end and no compensating apparatus for line drop is used. Suppose also that we allow 10% primary line drop it is clear that on peak the most distant transformer operates on but 90% of normal voltage and neglecting transformer regulation and secondary drop, lamps on this transformer

are receiving only 90% of rated voltage. If now we operate this transformer on a 5% tap in the primary winding we shall deliver 95% of rated voltage to the lamps, and deliver 105% of rated voltage at no load. Thus on peak when 100% of lamp load is in service these are receiving 95% of rated voltage instead of 90% and at no load when few lamps are affected we deliver 105% volts instead of 100%. Thus by the use of the tap we deliver better average service at the lamp than without.

Discussion on Mr. Schwenger's Paper

Mr. E. I. Sifton, Hamilton, Hydro-Electric System :

Before opening this discussion, I wish to move a vote of thanks to Mr. E. S. Schwenger for his very able contribution of a paper on distribution systems, which paper I consider as being one of the best presented to this Association since its inception.

Mr. Schwenger is to be complimented on the very able handling of distribution systems, and showing the results in favour of certain methods from the standpoint of voltage regulation and cost of copper. The figures submitted, with the exception of typographical errors, are correct, and the conclusions drawn from the foregoing standpoints absolutely indisputable.

There is no question in my mind but that too little attention is being paid throughout the Hydro municipalities and the Hydro System to voltage regulation and the giving of

service 100 per cent. perfect, or as near it as can be approached, both from a standpoint of interruptions and efficiency of distribution, which in the end means voltage regulation.

Hydro municipalities, as a whole, have been faced with a very rapid expansion in the use of electric current. The abnormal use of motors, heating appliances, stoves, and other current-consuming devices, assisted by the abnormal demand during war time, has created a condition such that any distributing engineer or manager might well hesitate, if he could have seen four years in advance of 1914.

This abnormal expansion exhibits itself in poor voltage regulation, lack of sufficient copper in a great many cases, which, however, was quite justified on account of high prices during the war period. Copper having reassumed reasonably normal figures, however, this paper fits in

with the now necessary demand of the consumer that they receive well-regulated, safe and reliable service.

I wish to comment on one method, presumably approved of by the writer, which, in my experience, has never proved satisfactory to the average system, and that is the method of banking transformers on a supply bus in any particular district in a city. The difficulty of renewing primary fuses when some short circuit accident happens to blow first one fuse and then the balance, through overloading of the remainder, is sufficient to warrant this system being discarded, in my opinion. Rumors have come to us at various times, where this system has been adopted, of the troubles on a rainy night, of a number of troublemen, distributed throughout several blocks, endeavoring to see signals from one troubleman to another by the method of waving a lantern, so that all fuses could be installed instantaneous, and thus holding the entire bank, several attempts being made before a successful termination is arrived at.

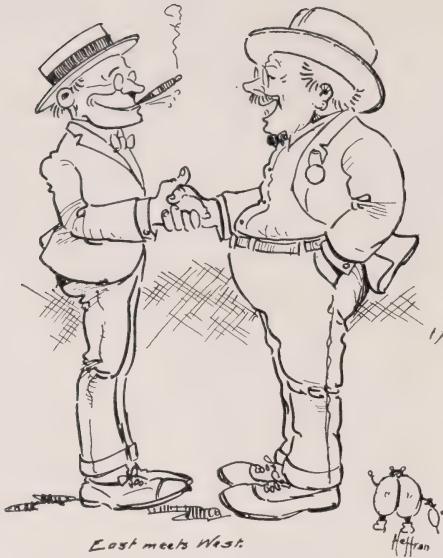
The suggested method of primary parallel connecting with two transformers, multiple connected and placed in series, is a very satisfactory system, and frequently is much better than placing a very heavy single transformer to accomplish this purpose.

The paper regarding choice of the feeder and main system, as compared to the single feeder system, might be further extended, as in practice the feeder and main system is not confined to a single street or one direction only, but usually the feeder supplies a load at a common centre, with

radiating lines in four or five directions, and in this way gives still better regulation than with the single feeder with many branches.

A further consideration with regard to the feeder and main system, however, is that the lack of pole space in many municipalities must be taken into serious consideration, the single feeder system being much more economical of pole space than is the feeder and main system.

With reference to the apparent recommendations in favor of three phase, four wire, 2,400 volt Star connected system, I have some criticism to offer. From the standpoint of economy of copper, there is no question but the conclusion is correct, but if we wish to consider economy of copper only, we might as well go to 13,000 volts, as that will be still less costly of copper, but it has other difficulties. A system which carries 2,400 volts to ground will, on the average, require to be constructed on at least 5 ft. longer poles than a 2,400 volt ungrounded system. Little, if any trouble, is noticed from an ungrounded 2,400 volt system, as compared with the touching of small branches and twigs of the many trees in our municipalities to a grounded system, which invariably has the effect of injuring the trees and giving a lot of trouble, owing to grounds. Such trouble usually occurs on a wet and stormy night, when there is little chance of repairing it. I consider also that the grounded 2,400 volt system is easily double as dangerous for working on by linemen, when alive, as the 2,400 volt ungrounded system. Further consideration must be given to switch construction, switchboard insulation, and all of the



difficulties of operating the 2,400 volt grounded distribution system voltage.

Considered from a standpoint of progression of voltages, it would seem to me that the 4,000 volt Star connected system is somewhat out of place. Starting with 110 volts and 220 volts, also a working voltage for standard requirements at 550 volts, for certain purposes, we then, in stepping to 2,400 volts, have approximately ten times the usual working current of 220 volts.

The next jump, in reasonable proportion, would be 13,000 volts, rather than just double the voltage you have previously standardized, and, personally, I would prefer to work on 13,000 volt ungrounded system to that of 4,000 volts with 2,400 volts to ground.

Reference is also made to the operation of single phase voltage regulators, and I desire to voice the common statement of manufacturers

and operators when I say that single phase regulators are a source of trouble, whereas the three phase regulation on closed delta system has, in our minds, proved eminently satisfactory, provided proper care be given to balancing of loads on the various feeders, at all times of the day, which, I might state, we have had no difficulty in keeping in reasonable perfect balance. Reference might also be made to the fact that 2,400 volt closed delta systems are much more standardized with the manufacturers for motor construction, switching, and other purposes than is the Star connected system, and for this reason, together with the relative costs of the equipment required on the two systems, I consider it advisable to retain the closed delta, 2,400 volt method.

One other consideration I might mention is that where a system has been adopted, using the closed delta 2,400 volts, that it would be very expensive to add the Star connected system, now that the equipment provided for same would have to have the reserves for speedy operation in excess of what would be required for the 2,400 volt closed delta system; in other words, by running with one standard, the banks of transformers, switches and equipment, generally, would be capable of inter-switching, and of being replaced by one set of reserve equipment, which flexibility would be greatly lost by adopting two systems.

Mr. J. G. Jackson, Hydro-Electric System, Chatham :

Mr. Schwenger's paper is of a very interesting nature, and covers a subject of extreme importance and of general interest.

To take up a number of points developed in the paper in the order in which they are treated: It is apparent that, subject to the examination of the character of the loading and possible unbalance, a very considerable reduction in the size of the neutral as compared to the outer conductors is permissible without interference with the character of the service, except in installations of small capacity or serving a limited number of consumers. This is particularly true owing to the fact that, although the extent of secondary networks may for several reasons be restricted, all neutrals of the same system may with benefit be tied together, with a consequent considerable addition to the effective neutral capacity. Besides the increased effective neutral capacity, it is apparent also that the connection of all neutrals in a general network lessens life and fire hazard by the paralleling of all neutral grounds.

The keeping of load records by means of the split core current transformer is very desirable and useful. It is, unfortunately, the case, however, that in a great many municipalities having a preponderance of transformers of 10 K.W. and under the limitations of this apparatus lessens its usefulness.

The advisability of assuming a loading of 150 per cent. for lighting transformers, even during the winter months, as a normal condition, owing to the consequent loss in efficiency and regulation at such times and the lessened reserve capacity, is one which would have to be considered very carefully, having regard to whether or not the extra losses due to overload add to the power pur-

chased and also the extent to which the greater line transformer peak load losses might be offset by the improvement of system power factor during periods of light load on such transformers resulting from the reduction in transformer capacity connected. With the increasing use of electric ranges, it would appear to me to be good practice to install transformers for normal loading to full capacity only, during the period of maximum lighting load, with an allowance of approximately 33 1-3 per cent. overload for range load occurring about noon. While it is evident that the range load may be great during the warm weather as in winter, the range peak is of shorter duration, and also does not seem as yet to have been coincident with the system peaks.

I believe it has been fully demonstrated, as indicated by Mr. Schwenger, that the iron pipe transformer or neutral ground is not reliable alone, although I am of the opinion that where a general neutral network is used, with all grounds in parallel, a considerable degree of effectiveness can be got with this type of ground. I have found it possible to provide a comparatively cheap and very effective ground by the use of a sheet of No. 22 gauge toncan metal, 36 inches wide, and rolled in an open cylinder 8 inches in diameter. This ground may be inserted by the use of a boring tool to a depth of eight feet in ordinary soil as easily as the driving of a pipe, and can then be filled with charcoal, if desired, and rammed, thus spreading the cylinder, so that a good contact is gotten between the soil and the entire outer surface of six square

feet. These grounds have been used for four years and no trouble experienced, and a number of these grounds recently dug up have been found to be in excellent condition.

With regard to the proposal that lighting transformers supplying a three-wire single phase secondary system be connected with the full secondary of each transformer on a single side of the 120/240 V. network or bus, while it may appear that a less area is affected in certain cases of secondary or transformer trouble, I am rather inclined to doubt the usefulness of this arrangement, not only because of the greater cost of transformers, due to the smaller sizes employed and the somewhat greater capacity required for the same loading, but also particularly because of the greater unbalance in voltage under unbalanced load conditions and because of the fact that, although the area affected by the trouble is lessened, the probability of the trouble proving sufficiently serious as to cause an interruption to service is very considerably increased due to the fact that the capacity available to supply the excessive overload or burn off the trouble without the blowing of fuses is greatly reduced, it being evident that with the so-called series connection the overload must be taken care of by one-half the transformer primary and heat dissipating capacity (due to size of tank, etc.) which would have been available by the standard method. It may also be noted that localization of trouble can readily be effected when the three-wire secondary connection is employed.

The question of feeder regulation and the comparison of the single

feeder distributing throughout a part or all of its length and the system in which a centre of distribution is established with distributing mains is of especial interest. It is to be noted, however, that it is not always possible to draw a distinction between the two types of feeder, owing to the location of heavy loads and the conformation of streets.

It appears to me, however, that the advantage of the simple feeder is more clearly established when it is remembered that the saving in regulator capacity and in pole space and labor makes it possible to provide a still greater effective weight of copper in the simple feeder, with consequent improvement in regulation and efficiency, as compared with the feeder and main system.

Mr. F. C. Adsett, Hydro-Electric Power Commission, Trenton.

I think the 13,000 volt power leads for transmitting large voltages is necessary in the larger cities, but I do not think Mr. Sifton's request for a standardized policy is practicable. I noticed that in his paper Mr. Schwenger allowed for a 50 per cent. overload on transformers. We have some range heating districts in Trenton where ranges are used a lot in the mornings, and we have to be very careful about not allowing an overload. I think about 5.7 of the consumers have ranges, and in one district over 25% of the consumers on a bank have ranges, which would change the conditions under which Toronto operates.

Another advantage of the three-phase four-wire system is that in a large number of cases the primary running to an outside district allows

for emergencies such as we have been up against in the last few years. It is always necessary to have both phase wires on the three-phase system and have a neutral on the secondary system, and run two transformers. I have had some connection with the 13,000 volt primaries, and they seem to serve the purpose better than a 41,000 three-phase wire, but for a small town the three-phased wire is better.

I would like to ask Mr. Schwenger what percentage of transformers are regulated on the line?

Mr. Adsett made other remarks, but it was quite impossible for the reporter to hear them distinctly.

Mr. H. C. Barber, Standard Underground Cable Co., Toronto :

It is five or six years now since I was actively engaged in distribution work, and I realize that considerable changes have taken place since that time, but the paper read by Mr. Schwenger and the discussion thereon have proved exceedingly interesting.

One point which was brought up was the development of the heating load. Apparently the range load at noon is becoming a factor which must be considered, and it seems to me that the question of the fusing of transformers is one that will require some consideration. It is a point that I think would be really interesting to the transformer manufacturers, because the arbitrary loading rating of transformers by their ampere current carrying capacity is hardly correct for the two loads; that is, the question of the maximum lighting load in winter time as opposed to the range load in summer

time. For the same current carried in summer time as opposed to the winter time, you would get a much greater heating effect in the transformer in the summer months. That is a point that might possibly require some consideration.

Mr. W. H. Mulligan, Hydro-Electric Power Commission :

I was pleased with Mr. Schwenger's paper, particularly his reference to the location of the cut-outs between the transformer and the neutral, and I would like to ask if the installation of the cut-out on the neutral side of the transformer was the result of accidents happening to linemen in putting in the fuses on a short-circuited transformer.

Mr. Schwenger also demonstrated a method of bringing down primary wires clear of poles, which is a very important feature.

I would like to ask Mr. Schwenger or any other gentleman in the room their opinions about the sectionalizing of the lines in the towns.

Mr. Schwenger:

Regarding Mr. Sifton's first observation about the two mains in my paper. That was used merely for simplicity's sake. It was intended that the remark should apply to mains running in all directions from the centre of distribution, but for the purposes of calculation I used it to show the principle. It is very seldom the feeder is laid out in that way.

Regarding the use of 2,200 volt motors, we try in Toronto, especially for new consumers, to use 4,100 volt equipment, and that is being done right along quite satisfactorily. There is a point in connection with the use of 2,200 volt meters on delta connected feeders, where one line is

allowed to form an arc in the ground; it brings up static stresses in the motors themselves, which is not desirable. I recall one case of a motor which failed on account of the ground developing on one of the feeders like that. The investigation showed it was that ground that set up the stresses in the motor. That would not happen on a 4,100 volt motor. Should one of the lines ground, the switch at the station would kick out, and the emergency man would go out and find out what was wrong. It is a positive indication when you have a ground.

Regarding the so-called destruction of trees with 4,100 volts, I do not think I can bear Mr. Sifton out in that, because we have had just as much destruction by 2,200 volt feeders as by 4,100 volt feeders; there is no noticeable increase.

Mr. Sifton made the statement that it would take six or seven attempts before one could successfully plug in a bank of transformers. That is not true with our system, because the maximum number we bank is four, and the maximum number of men we have on hand for emergency work is four; so there is no trouble in getting in any banks that blow their fuses. There was a time when we did experiment with large banks, and found it was not desirable to bank large numbers on account of just that trouble—the difficulty of getting them back into service again.

Our experience with single-phase regulators shows that they are very good. There is no trouble with them, and that also applies with the three-phase regulator; but the point I wished to make was that you could

not take care of any extra heavy load on one phase where three-phase regulators are used for some local load.

In Toronto we find it desirable to use a 10 per cent. regulator; we could not use the 5% regulator that Mr. Sifton uses. Our variation on 13,000 volts is somewhat more than Mr. Sifton mentions. Sometimes it goes up to 15 per cent.

Regarding the pole line space being used up, we have not experienced any trouble with that arrangement. We find that the maximum number of feeders required in any one district can be carried by the pole line. The load is not concentrated to such an extent that more feeders are required on the pole line.

I was very much interested to hear Mr. Jackson's experience with the Tonkin metal. We have not tried that, but have tried a carbon solution, not a hollow but a solid solution, buried in coke, and have found it inexpensive and very satisfactory. I have only had about two years' experience with that, and cannot say they will work out better than the copper for long periods. We have dug up the copper and found it has disintegrated in some cases, due to the natural acids in the soil, and that is why we experimented with carbon. I will follow Mr. Jackson's suggestion to use Tonkin metal, and see what results we can get with it.

In connection with the series connection of transformers, Mr. Jackson brought out the point that a large number of small units would be used. That hardly applies with us, because our loads are large, and we use transformers with a minimum size of 15 kilowatts, which is not an

extra small transformer. We are rapidly standardizing on the 25-kilo-watt transformer.

Mr. Jackson also mentioned there might be some difficulty in establishing the centre of distribution, and also stated that in many cases you have to approximate one. That is quite true, but that is regarding the establishing of an approximate centre of distribution; there is no difficulty in establishing that approximate centre of distribution and obtaining good regulation all over the feeder.

Regarding the electric range loads, we find these loads do not coincide with the lighting loads, although in some cases they are larger than the lighting loads. In those cases we take readings at the range peak and not the lighting peak. We obtain that information from recording watt meters put on the secondaries of the transformer. We keep a map showing each range put on, and as soon as it is put on, we make an investigation, and use the load found to be the highest as the governing load on a bank.

Regarding cut-outs, our experience is that the ordinary porcelain cut-out is not much good for anything over 15 or 20 amperes, and we are using quite a large number of enclosed fuses in metal boxes, and find them satisfactory.

Latterly we have been using the oil cut-out for large capacities, and find them very good. In fact, they can be closed with safety under short-circuit conditions by the men without any danger at all. It has often been done, and the men are confident about them.

Regarding Mr. Adsett's remarks on the thawing out of water pipes, he mentioned the use of the 2,200 volt connection for the transformers. I might just give you our experience in thawing out water pipes. We do not use the primary voltage at all, but use the heavy secondary bus and transform down and thaw almost every pipe in the city in that way. A very simple device is used, a small transformer of 44 volts hooked right on to the bus; we find the capacity is ample for that purpose.

I think my remarks on the range loads would answer Mr. Barber's question. We have found cases where the range load in any particular district has run as high as four times the lighting load, but that becomes the governing load for the two.

Regarding the use of fuses on the neutral side of the transformers on the primary, we did instal those for safety purposes, but the men in bad weather, especially in the dark, have had some bad experiences with fuses blowing up in their hands, and where two are used, the arc is taken on a closed plug, as the blowout is made there, and the men are in a safe condition.

The sectionalizing of the lines becomes an easy feature where a feeder and main system is used, because at the centre of distribution you have four, five or six mains running away, and each one of those can be controlled by a small wing-nut connection fuse or a very easily unwrapped connection, and we find it very useful in that way.



Report of the Secretary

I beg to report a satisfactory increase in our membership since last year. The total paid-up memberships are as follows:

Utilities.....	105
xCommercial Members..	34

Of the Utilities 26 are new members and are as follows:

Goderich, Aylmer, Ayr, Elmira, Exeter, Milton, Palmerston, Petrolia, St. Mary's, Simcoe, Tavistock, St. George, Wellesley, Brantford Township, Leamington, Kingsville, Essex, Harrow, Amherstburg, Fenelon Falls, Picton, Kingston, Orillia, Mount Forest, Cannington and Chesley.

Seven Utilities who were members during 1918 have not renewed their membership for this year, and have, therefore, been dropped from our list. They are: Hensall, Port Dalhousie, St. Jacobs, Stirling, Orangeville, Woodville and Sunderland.

We have, therefore, a net gain over 1918 of 19 member Utilities.

Of the commercial memberships, 18 were elected at the January Convention in Toronto. One other company that was elected at that time has not paid the fee for membership, and has not, therefore, been included as a member in good standing. The company in question is the Utility Electric Mfg. Co. of Welland. Sixteen companies have expressed their desire to take commercial membership in this Association, and have advanced us the amount of dues for this year, on my assurance that they would be accepted by the Association at this Convention. These companies have all been supplied with credentials to permit their repre-

sentatives attending this Convention. A great many if not all, of them are represented here to-day, a number taking part in the exhibit downstairs. The following companies are, therefore, submitted for election as commercial members:

- Addressograph Sales Co., Toronto.
- Burroughs Adding Machine of Canada, Ltd., Toronto.
- Canada Wire and Cable Co., Limited, Toronto.
- Crown Electric Mfg. Co., Limited, Brantford.
- The Hoover Suction Sweeper Co. of Canada, Limited, Hamilton.
- Jefferson Glass Co., Limited, Toronto.
- Lowe Martin Co., Limited, Toronto.
- Majestic Electric Supplies, Limited, Toronto.
- McClary Mfg. Co., London.
- Moloney Electric Co. of Canada, Limited, Toronto.
- Munderloh & Co., Limited, Montreal.
- Rogers Electric Co., Limited, Toronto.
- Rose & O'Hearn, Toronto.
- Sangamo Electric Co. of Canada, Limited, Toronto.
- Standard Underground Cable Co. of Canada, Limited, Toronto.
- Superior Electrics Limited, Pembroke.

Membership cards have been issued as follows:

Class A.....	107
Class B.....	166
Associate.....	52
Commercial.....	114

In addition to one Class A membership card being issued for each member utility, two have been issued to the O.M.E.A., and one to the Manager for the Hydro-Electric Power Commission located in Peterborough.

Since the January Convention, a number of men have entered the employ of the Hydro-Electric Power Commission of Ontario, whose duties are such as to make their attendance at our Conventions desirable. Associate cards have been issued to them and to some others desiring admission, so as to avoid complications as to their attending this Convention prior to their election. The following names are submitted for election as Associates:

D. J. McAuley.
B. Mulholland.
H. D. Rothwell.
D. N. Duffy.
T. R. C. Flint.
S. B. Iler.
G. B. Smith.
E. C. Settell.
A. E. Clark.
L. A. Eagleton.
J. W. Millar.
W. J. Montgomery.

(x) This Report has been revised to include new commercial members as reported to Convention in a supplementary report, and also one paid in 1918 and credited to 1919.

Convention Notes

T. C. says Ernie snores too loud.

Early hours of morning, 40 miles per hour, no headlights. Going some.

Hall boys in ice cream suits. Others because much in evidence.

Room with bath. Door locked on inside. Ask L. G.

Stripped to the belt. No, the contest was quite friendly.

5.00 a.m.: "What are you getting up so early for?" "I am not; just going to bed."

Eisey found an empty water jug effective in proving who was asleep.

Three were registered in two rooms; four slept there. Was that honest?

George D. is after the scalp of the man who said the Niagara Inn is a quiet place.

A. G. cannot see why neglect to register should upset the whole hotel accounting system.

Does anyone know whether that police sergeant returned the dollar?

Some found the water on the New York side of the river more palatable than on the Ontario side.

M. J.: "Why is the water below the Falls so green?" J. E. B.: "Because it has just come over."

THE BULLETIN

Financial Report

Balance on Hand, February 1st., 1919 \$ 164.62

Received:

4	Municipalities at \$50.00.....	\$200.00	
5	" " 25.00.....	125.00	
11	" " 15.00.....	165.00	
14	" " 10.00.....	140.00	
18	" " 7.50.....	135.00	
26	" " 5.00.....	130.00	
27	" " 2.00.....	54.00	
33	Commercial Memberships.....	330.00	
	Dinner Tickets.....	117.00	
			1,396.00
			\$1,560.62

Disbursements:

Stationery and Printing.....	\$ 28.40	
Exchange on Cheques.....	7.20	
Expenses of Executive.....	164.33	
Convention:		
Music.....	14.50	
Dinner.....	187.00	
Stenographer.....	20.00	
Supplies for Lantern.....	13.95	
Janitor.....	5.00	
		695.38
Balance on Hand.....	\$ 865.24	



THE GAME.

CHIPPEWA DEVELOPMENT ACCOUNTING DEPARTMENT

PLAYER.....	I	2	3	4	5	6	7	A.B.	R.	H.	P.O.	A.	E.
Robinson (1 B.)....	1	1		0	0			4	2	2	10	0	0
Clarín (3 B.).....	1	1		0	1			4	3	2	1	3	1
Dickinson (S.S.)...	1	0		X	X			4	1	2	1	1	0
Andrews (P.).....	0	X		0	0			4	0	0	0	2	0
Jones (2 B.).....	0	0			0	X		4	0	1	1	0	1
McGarr (C.F.)....	1		0		1	0		4	2	1	0	0	0
Honsberger (C.)...	0		0		1	0		4	1	0	7	0	0
Burns (R.F.).....		0	X		1	0		4	1	0	1	0	0
Edmundson (L.F.).		1	0					2	1	0	0	1	0
Totals.....	4	3	0	0	4	0		34	11	8	21	7	2

ASSOCIATION OF MUNICIPAL ELECTRICAL
ENGINEERS

Hartrick (3 B.)....	0		0		1		0	4	1	0	3	1	1
Heeg (P.).....	0		0		1		0	4	1	0	3	1	1
Kribs (1 B.).....	X			0	0		0	4	0	0	8	0	1
Cooper (S.S.)....	0			X		1		3	0	1	0	3	1
Flint (C.F.).....		0		X		0		3	0	0	1	0	0
Hearn (L.F.).....		X		0		X		3	0	0	1	0	1
Lang (2 B.).....		0		0		X		3	0	0	0	1	1
Bass (C.).....		0			0	0		3	0	0	4	0	2
Caster (R.F.).....			0	1	0			3	1	0	0	0	0
Totals.....	0	0	0	0	2	1	0	30	3	2	18	7	7



St. Lawrence System

Power was delivered to the Toronto Paper Co., Cornwall, for the first time on June 19th. This company will be increasing their load from time to time. It is expected that in a short time their requirements will be from 750 to 1,000 H.P.

A tie line between the Rideau and St. Lawrence Systems is being considered. Investigation of the cost of this and advisability of installing same is being made.

Rideau System

Power is being delivered to High Falls for construction purposes from the Rideau System.

Pembroke

The municipality is negotiating with the Pembroke Electric Light Company for the purpose of improving their street lighting and installing a pedestal system in the business section. Assistance is being rendered by the Commission to the municipality.

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Hydro Municipalities

NIAGARA SYSTEM 25 Cycles

	Pop.
Acton	1,570
Ailsa Craig	462
Ancaster	400
Ancaster Township	4,577
Aylmer	2,119
Ayr	780
Baden	710
Barton Township	6,061
Beachville	503
Biddulph Township	1,750
Blenheim	1,257
Bolton	727
Bothwell	695
Brampton	4,023
Brantford	26,601
Brantford Township	7,739
Breslau	500
Bridgen	400
Burford	700
Burford Township	3,882
Burgessville	300
Caledonia	1,236
Chatham	13,943
Chippewa	707
Clinton	1,981
Comber	800
Dashwood	350
Delaware	350
Dereham Township	3,176
Dorchester	400
Dorchester S. Ty.	1,457
Drayton	613
Dresden	1,403
Drumbo	400
Dublin	218
Dundas	4,834
Dunnville	3,286
Dutton	840
Elmira	2,065
Elora	1,005
Embro	472
Etobicoke Township	5,822
Exeter	1,504
Fergus	1,679
Flamborough E. Tp.	2,229
Forest	1,421
Galt	11,920
Georgetown	1,654
Goderich	4,553
Grantham Township	3,133
Granton	300
Guelph	16,022
Hagersville	1,053
Hamilton	104,491
Hamilton	1,563
Hensall	717
Hespeler	2,887
Highgate	427
Ingersoll	5,300
Kitchener	19,380
Lamketh	350
Listowel	2,291
London	57,301
London Township	6,024
Louth Township	2,212
Lucan	643
Lynden	662
Markham	909
Merriton	1,670
Milton	1,947
Milverton	929
Mimico	2,004
Mitchell	1,656
Moorefield	335
Mount Brydges	500
New Hamburg	1,398
New Toronto	1,423
Niagara Falls	11,715
Niagara-on-the-Lake	1,313
Norwich	1,093
Norwich N. Township	2,029
Norwich S. Township	1,907
Oil Springs	537
Otterville	500
Palmerston	1,843
Paris	4,437
Petrolia	3,047
Plattsville	550
Point Edward	937

Port Credit	1,179
Port Dalhousie	1,318
Port Stanley	831
Preston	4,949
Princeton	600
Ridgetown	2,080
Rockwood	650
Rodney	626
Sandwich	3,077
Sarnia	12,323
Scarborough Township	5,525
Seaforth	2,075
Simcoe	4,032
Springfield	422
St. Catharines	17,917
St. George	600
St. Jacobs	400
St. Mary's	3,960
St. Thomas	17,216
Stamford Township	3,418
Stratford	17,371
Strathroy	2,816
Streetsville	500
Tavistock	974
Thamesford	504
Thamesville	742
Thorndale	250
Tilbury	1,605
Tillsonburg	3,059
Toronto	460,526
Toronto Township	5,008
Townsend Township	3,268
Vaughan Township	4,059
Walkerville	5,349
Wallaceburg	4,107
Waterdown	696
Waterford	1,027
Waterloo	5,091
Waterloo Township	6,538
Watford	1,115
Welland	7,905
West Lorne	708
Wellesley	583
Weston	2,283
Windsor	26,524
Woodbridge	615
Woodstock	10,004
Wyoming	526
Zurich	450

Total 1,060,915

SEVERN SYSTEM 60 Cycles

Alliston	1,237
Barrie	6,866
Beeton	588
Bradford	946
Coldwater	617
Collingwood	7,010
Cookstown	635
Creemore	599
Elmvale	775
Midland	7,109
Orillia	7,448
Penetang	3,672
Port McNichol	500
Stayner	990
Thornton	250
Tottenham	557
Victoria Harbor	1,542
Waubashene	600

Total 41,941

WASDELL'S SYSTEM 60 Cycles

Beaverton	821
Brechin	215
Cannington	746
Sunderland	570
Woodville	357

Total 2,709

NIPISSING SYSTEM 60 Cycles

Callander	650
Nipissing	400
North Bay	9,651
Powassan	572

Total 11,273

MUSKOKA SYSTEM 60 Cycles

Gravenhurst	1,600
Huntsville	2,135

Total 3,735

EUGENIA SYSTEM 60 Cycles

Alton	700
Artemesia Township	2,396
Arthur	1,003
Chatsworth	286
Chesley	1,860
Dundalk	750
Durham	1,520
Elmwood	500
Flesherton	428
Grand Valley	586
Hanover	3,310
Holstein	285
Horning's Mills	370
Markdale	904
Mount Forest	1,871
Neustadt	470
Orangeville	2,381
Owen Sound	11,819
Shelburne	1,018
Tara	620

Total 33,057

OTTAWA SYSTEM 60 Cycles

Ottawa	100,561
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PORT ARTHUR SYSTEM 60 Cycles

Port Arthur	15,224
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CENTRAL ONTARIO SYSTEM 60 Cycles

Belleville	12,080
Bowmanville	3,545
Brighton	1,278
Colbourg	4,457
Colborne	811
Deseronto	2,061
Kingston	22,265
Lindsay	7,752
Madoc	1,114
Millbrook	746
Napanee	2,881
Newburgh	444
Newcastle	600
Oran	446
Orono	700
Oshawa	8,812
Peterboro	28,996
Port Hope	4,486
Stirling	823
Trenton	5,149
Tweed	1,350
Whitby	2,902

Total 113,718

ST. LAWRENCE SYSTEM 60 Cycles

Brockville	9,473
Chesterville	878
Prescott	2,670
Williamsburg	100
Winchester	1,042

Total 14,113

RIDEAU SYSTEM 60 Cycles

Perth	3,358
Smith's Falls	6,115

Total 9,473

ESSEX COUNTY SYSTEM 60 Cycles

Amherstburg	1,900
Canard River	70
Cottam	100
Essex	1,479
Harrow	375
Kingsville	1,632
Leamington	3,604

Total 9,181

*THE aim of the
Bulletin is to
provide municipalities
with a source of infor-
mation regarding the
activities of the Com-
mission; to provide a
medium through which
matters of common
interest may be
discussed, and to
promote a spirit of
co-operation between
Hydro Municipalities.*